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SECOND (MILITARY INFORMATION) DIVISION.
GENERAL STAFF.
Ser. 2 No. 8.

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MAR 11 1907

REPORTS
OF
MILITARY OBSERVERS
ATTACHED TO
THE ARMIES IN MANCHURIA
DURING THE
RUSSO-JAPANESE WAR.

(SEPTEMBER 1, 1906.)

PART I.

Reports of—
- Lieutenant-Colonel W. S. SCHUYLER, General Staff,
- Captain J. F. MORRISON, 20th Infantry,
- Captain CARL REICHMANN, 17th Infantry,
- Captain PEYTON C. MARCH, General Staff.

WASHINGTON:
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1906.

WAR DEPARTMENT.
Document No. 273.
Office of the Chief of Staff.

NOTE.

Of the following reports of observer with the Japan and Russian forces those of Captains March and Morrison practically complete, as submitted by them.

It has not been practicable to publish the complete repo of Lieutenant-Colonel Schuyler and Captain Reichmann account of their length, and numerous omissions have b made in the text of their reports, especially in those parts covered directly by the personal observations of the offic concerned.

Reports of Capt. Peyton C. March, General Staff, Observer with the Japanese Army.

NOTE.—Captain March arrived in Tokyo March 27, 1904, and was assigned by the Japanese war office to the First Japanese Army, commanded by General Kuroki. He left Tokyo for the theater of operations on April 30, joining the headquarters of the first army at Fenghuangcheng on May 15, 1904. After joining the army he was assigned by General Kuroki to the Second Division, with which organization he remained until November 20, 1904, when he returned to the United States.

REPORT NO. 1.

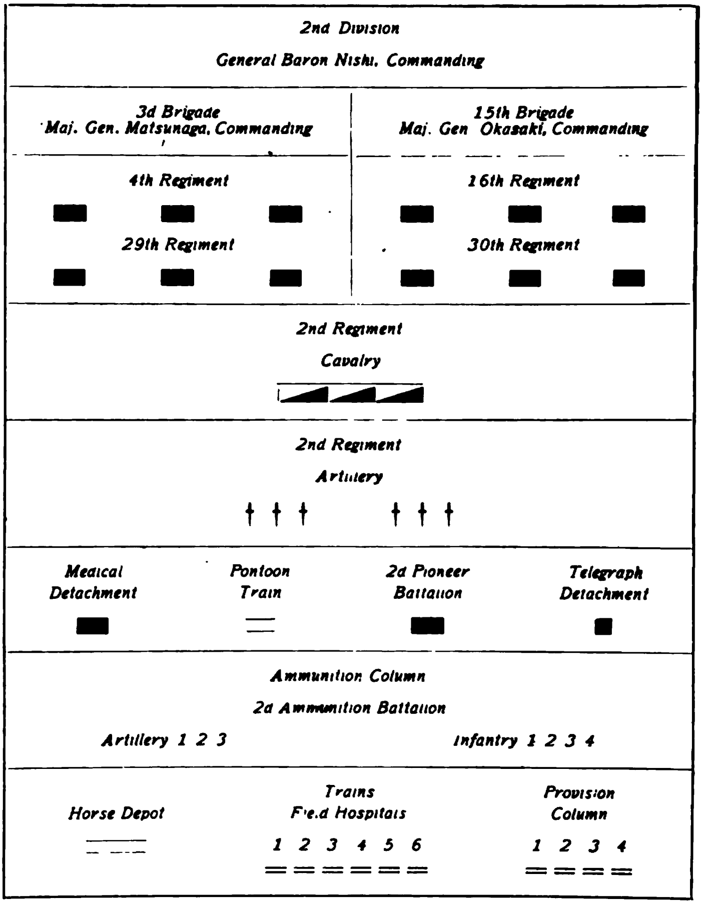
LIENSHANKUAN, MANCHURIA,
July 30, 1904.

SIR: I have the honor to submit the following report of the operations of the Second Division, First Japanese Army, during its advance from Fenghuangcheng, Manchuria, toward Liaoyang, to include the above date.

The attachés who were assigned to this division were notified that the advance guard of the division would leave Fenghuangcheng on June 23, the main body starting the following day. We applied to go with the advance guard, which was at first granted. Later we were informed that we must go with the headquarters of the division, which was to start from the point of concentration of the division just outside of Fenghuangcheng at 7.30 a. m. June 24.

At 7.30 a. m. promptly, the commanding general moved out, marching with a small cavalry escort and proceeded to Hsuliten, which was reached at 2 p. m. Here we camped for the night.

The division was organized as follows:



The strength of the division in round numbers is—

Combatants	14,000
Guns	36
Noncombatants	6,000

The Second Division Staff consists of—

Chief of staff, Colonel Ishibashi.

Vice chief of staff, Lieutenant-Colonel Ukuju.

Assistant chief of staff (cavalry), Major Watanabe.

Assistant chief of staff (infantry), Captain Yamada.

Adjutant-general, Major Kanauchi.

Aids: Captain Nakamura, Lieutenant Kusaka, and Lieutenant Ujiama.

Division headquarters has also attached to it 3 surgeons, 3 intendants, and 3 paymasters.

The advance guard marched, with infantry in front, with the pioneers, followed by one battery of artillery and the cavalry. The commanding general marched between the advance guard and the main body, which was composed of infantry, and was followed by five batteries of artillery, the ammunition columns, and the train.

The road, for the entire distance, was among hills from 250 to 1,500 feet high, the country having no mountain axis, the hills being all jumbled together. It is no country for cavalry and explains at a glance why the Cossack cavalry patrols are constantly being captured by the Japanese infantry.

From the outset wounded and captured Russians, picked up by the advance guard, began to come back along the column, and these were always questioned by the attachés with this column who speak Russian. These captives were in nearly every instance surprised by the Japanese point, and their accounts gave a very unfavorable impression of the manner in which the Russians were conducting their service of security and information, while that of the Japanese was characterized by alertness and snap.

At short intervals along the road the general received reports by courier of the progress of affairs along the front. These reports were invariably handled with correctness, the courier being given a receipt by the staff officer who handled it, time carefully noted on it, and a record of the transaction being entered in his own notebook, all before he took it to the general. A mounted telegraph squad accompanied the headquarters, one of the men carrying a staff with two prongs like a pitchfork, terminating in polished balls, and communicating through the body of the staff to a sounder, from which messages were taken from the wires when desired. The reports received were frequently communicated to us and gave the position and numbers of the Russian forces in front of us, which fell back steadily as we advanced, without making any special stand.

We left Hsuliten at 5.50 a. m. June 25 and at 7.30 a. m. caught up with the advance guard which, seen from the mountain tops, was spread out before us. A Russian suboffícer and five men were passed a short distance north of

Domonshi. The officer told us that he and his men were asleep at Domonshi and were surprised by the Japanese advance. The Russians had had 2,000 men and 6 guns near Domonshi, but on the 24th they retired to the north, leaving only 200 men, of which body the captured men were an outpost. The Third Division of the East Siberian troops was said to be in the vicinity of Lienshankuan. We camped for the night near Hanchiatai, where we arrived at 1.40 p. m. Some fifty or sixty Russians were on the hills north of the town watching our advance, but retired as we entered the town. The weather since starting had been clear and very hot, but there was surprisingly little straggling for a command of this size. The advance guard moved forward and drove back 300 Russian cavalry about 2 miles north of the town.

On the 26th we left bivouac at 7.50 a. m. and made a short march to Washosho, where we arrived at 11.50 a. m. and where we remained until the 30th. The division went into bivouac in the valley at this point, the artillery and train coming up in good condition. The batteries of artillery marched with all their guns in front of the caissons, instead of each gun being followed by its caisson in the American style, the cannoneers all on foot, the cannoneers' seats being covered with supplies and equipment. When we left Fenghuangcheng, the guns were covered with paulins, but as we got contact they marched cleared for action with sights in position. Colonel Tada, who commanded the artillery, marched with the general at this point, as did also the chief of pioneers. While we remained here 23 Russians, most of them wounded, passed through to the rear in small batches.

The wait at this point seemed to be for the purpose of arranging for an attack in force upon Bunsuling (three hours' march to the north), where the Russians had constructed very strong earthworks, which they were occupying with both infantry and artillery. However, on the 27th, the Russians evacuated both Bunsuling and Lienshankuan, burning their stores. They had two regiments of infantry at each place, with artillery in addition at Bunsuling.

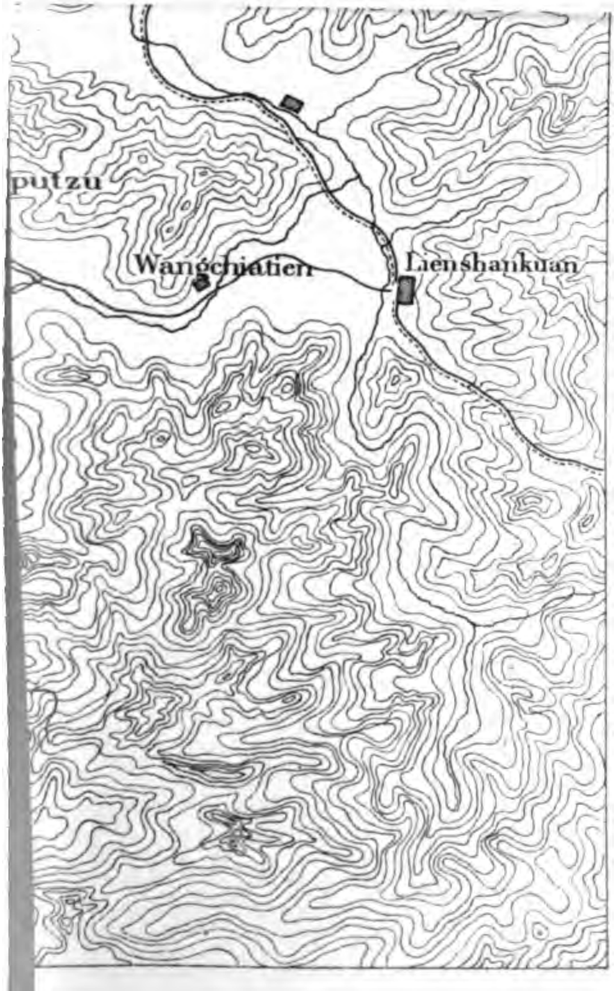
It began to rain on the night of the 27th and poured during the 28th and 29th, making an advance inadvisable. The command broke bivouac and moved into villages and huts along the route until the flood ceased.

At 7 a. m. on the 30th we moved out, passing through the Russian works at Bunsuling at 10.30 a. m. These were in successive lines, well chosen, well made, with good roads cut to all points of the lines. The first line was on a saddle perpendicular to the road. It contained gun pits for 8 guns on the right of the road and for 24 on the left. These were supported by infantry intrenchments which followed the natural line of the hills and gave a slightly converging fire upon the valley, up which the Japanese must advance. The flanks of the position rested upon high hills, and these hills themselves were crowned with infantry intrenchments. The position could not be commanded by any point within effective range and covered the general line of retreat. The intrenchments and gun pits had been constructed at leisure and were typical, presenting no new features, except that it may be said that they were vastly superior to the Russian earthworks at the Yalu crossing, which were extremely poorly made both as to type and position.

The second line of defense was a redoubt within supporting distance of the first position. This redoubt had front and rear faces about 100 yards long, with sides about 150 yards. The front and rear faces were connected by a zigzag sap, which allowed the men in front to retire in safety to the rear. The third line was the crest of the next divide, about 1,000 yards from the redoubt. In all, the Russians had done an immense amount of work to make a strong position, bridging streams, repairing roads, making new roads.

While we were examining these works the advance guard reported the Japanese occupation of Motienling without resistance. We moved on to Lienshankuan, where we were to remain for a long time. Bunsuling is the natural line of defense for Motienling against an advance from the south. The abandonment of these strong positions by the Russians without any fighting was a great surprise to the Japanese and was undoubtedly a serious strategic blunder. The determined attempts of the Russians to retake the Motien pass on the 4th and 17th of July show that they realized their blunder thoroughly.

The movements of the Second Division were of course part of a large and comprehensive scheme of advance involving matters and strategy which will be discussed in other reports.


putzu
Wangchiatien
Lienshankuan

pany at B, hearing the sound, came up to their assistance, together with the company at E. The battalion reserve at A was formed under arms at the first shot—about 4.15 a. m. The major sent one company direct to the fight and held the other to prevent his position being turned by an advance along the new road E. Nothing of the kind happening, he led his last company to the fight and pursued the Russians, who by this time had been driven back down the valley to D, where they involved the battalion of the Twenty-fourth in their retreat. This was at 4.50 a. m. The Japanese lost 18 killed and 30 wounded. The Russians left on the field 53 dead, 47 wounded, and 2 unwounded captives, 98 rifles, and other impedimenta.

The following morning the Japanese put two battalions in front of the pass, and a battery in gun pits upon the crest F.

Frequent skirmishes between patrols, with small losses on both sides, led up to an attack in force by the Russians upon the Motienling position on July 17. That the attack was to be made was known to the Japanese in advance. Their spy system is perfect. Their familiarity with the Chinese language; the readiness with which a Japanese can simulate a Chinese; and the utter impossibility of the big, blue-eyed, fair Russian successfully accomplishing such a feat, gives to the Japanese a great advantage while operating in this country, to say nothing of the friendliness of the inhabitants. The general plan of the Russian attack on the 17th was to throw a large force against the position at Motienling and at the same time to turn the position by both flanks. Motienling (the Chinese termination *ling* meaning pass) is probably the best known of all the mountain passes in Manchuria. The Chinese occupied it during the winter of 1894–95, and it was never taken by the Japanese. It is an interesting fact that the Chinese believed that the pass was saved to them on account of the virtues of the temple of Kwantei (B) so, after the war they erected a branch temple (A) in honor of the event, nearer the pass, both temples being used now by the Japanese as quarters for the men or as temporary hospitals for the wounded, as occasion has required. As a military problem, Motienling is only formidable, when the passes to its right and left are securely held. A glance at the map will show how easily it can be turned, either by Gebato or

Hsinkailing. The general front of the division on the day of the attack was, therefore, Hsinkailing-Motienling-Gebato.

The Russian force under command of General Keller consisted, in whole or in part, of seven regiments, their numbers as they appeared upon the dead and wounded being the Eleventh, Twelfth, Twenty-first, Thirty-third, Thirty-fourth, and Thirty-fifth. I saw only one battery of artillery with them and about 150 cavalry. This was the first battle in which troops from European Russian had opposed this army and was especially interesting on that account, as the claim had been repeatedly made that the Siberian troops were inferior to those from Russia proper.

At 12:30 a. m. of the 17th, the brigade commanders knew that the Russian force was moving toward them through the dense fog that crossed the mountains, and both wings prepared to meet them. In front of Motienling the outposts fell back on their supports when the Russians struck them—about 3 a. m.—and the supports retired to the line of defense of the brigade (F. F. F.) without making any special resistance. The Russian advance moved up to a position along the hill by the new temple (A) and across the valley near E, where they intrenched. Infantry fire began at 4:45 a. m., and continued until 6.45, when the fog cleared and the Russians were observed in the position indicated above. Their line was reenforced from time to time until its maximum strength was four regiments. The Japanese battery at F at 6.45 a. m., opened fire for the first time, and the fighting at this point continued with great vigor until 9 a. m. In the meantime the Russian turning column had come in contact with the Sixteenth Regiment of Japanese Infantry at Kodoko, near Gebato, and had been fighting since 6 o'clock. At about 9 a. m. two companies of the Sixteenth Infantry, who were on the left of the Japanese right wing, charged the left of the Russian right wing and drove it back, the Russians massing together and suffering many casualties from the artillery fire at F. The Japanese infantry advanced and drove the Russians back across the hills and down the main road toward Chinchiaputzu.

The attempt to turn the Japanese left at Hsinkailing was made by the Russian battalions coming from the direction of Tawan.

The Fourth Regiment (Japanese) which occupied this point went out to meet the Russians, drove them back, and at 1 p. m. were able to open fire upon the Russian main body retreating from Motienling.

The attack on the Japanese right in the vicinity of Gebato was made from the northwest by one regiment of Russian infantry and one troop of cavalry, and from the north by eight companies of infantry and one or two troops of cavalry. During the fight I was with the Japanese forces in front of Motienling, and was not permitted to visit Gebato until the 24th. The fight at that point was extremely desperate, lasting from 6 a. m. to 5 p. m. at the position near Nidoko, before the Russians fell back.

The Russians were protected in their retreat by a reserve in the vicinity of Chinchiaputzu, consisting of a regiment of infantry and 8 guns. This artillery fired some 16 shrapnel at about 2 p. m., but did not take part in the general engagement.

The Japanese loss in the engagement was: Killed, 1 captain, 3 lieutenants, 39 noncommissioned officers and men; wounded, 1 major, 2 captains, 9 lieutenants, 244 noncommissioned officers and men. Total casualties, 299.

They buried 200 Russian dead and took 50 captives, 11 of whom were unwounded, and a large quantity of ammunition, rifles, etc. The Russian report puts their casualties at 1,000.

The immediate effect of this battle was a concentration of the division, whose troops were pretty widely dispersed. The Fourth Regiment came in from Hsinkailing, that important point being covered by the Guards. Another battery of artillery was sent to Motienling and the outposts drawn in slightly.

The retention of the pass against a superior attacking force was extremely important, and the division received telegrams of commendation from the Emperor and Empress upon the result.

This was the first battle in which the attachés had been allowed to see the Japanese under fire. Upon arriving at the pass from Lienshankuan three of us pushed through the woods in the direction of the firing, coming out at a point where we observed the deployment of the Japanese troops on the left and coming under Russian infantry fire at less than 1,000 yards.

After observing the advance on this side for some time, we crossed over to the right, passing to the crest of the hill at C′, from which point we observed the general retreat of the Russians, the position of their artillery and reserves, and the ambulance train carrying off the wounded.

The following points were noticed:

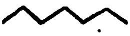
1. The greater invisibility of the Japanese smokeless powder for small arms. The fire of the Russian infantry betrayed their position by a light-blue smoke, while detection of the Japanese smoke was impossible to my eyes, although I was looking at the men firing.

2. The Russians took no advantage of cover, the Japanese showing much better training in that respect.

3. The Japanese were all in khaki, about the same shade as that used by the United States troops in the Philippines (not olive-drab), and were much more indistinguishable than the Russians, with their black trousers and boots and officers with white coats.

4. The Japanese footgear is much better suited for work in these mountains than the Russians'. The Japanese soldier wears a khaki puttee wound around his legs, with shoes having rosette-headed nails, the heads projecting from the soles. The Russian wears boots, which make him lumbering and clumsy in his movements. I am referring to the infantry.

5. The supply of ammunition to the infantry firing line by the Japanese was by pack pony to the nearest cover, from there to the firing line by men carrying slung over their shoulders as many packages as they could in very conspicuous white muslin or cloth of some kind. This, if course, would get dirty in a short time, but there was no reason why they should not have used khaki. The ponies are packed with one rectangular-shaped ammunition box on each side, painted gray, and having rope handles at the ends. They might hold some 1,200 rounds apiece, or 2,400 to the horse; but this is only an estimate.

6. The Japanese regiments carry their war flags on the firing line in battle; the battalions of a regiment have a white flag, the first battalion having a red streak across it like this: ; the second battalion having two streaks, one

red and one blue, and the third having one red between two blue streaks. There is no question but that the flags are of great value in assisting the artillery in determining when to stop their fire during an advance of their own infantry, although the position of the line is betrayed to their opponents also.

7. Japanese used individual fire, except in a few instances, when the target was at very long range, when they fired volleys. The Russian fire was entirely by volleys on this occasion, as far as I could judge.

8. The Russian retreat was made coolly and without evidence of demoralization.

9. The Japanese pursuit was not driven home, presumably because the time had not come for this army to move.

On the night of July 30 we received orders to move the next morning at 3 o'clock.

REPORT NO. 2.

TIENSHUITIEN, MANCHURIA,
August 15, 1904.

My report No. 1, dated July 30, 1904, concluded with the announcement of the intended advance of the Second Division on July 31. During the whole of July 30 troops had been passing through Lienshankuan, going to the front; and trains carrying provisions, hospital supplies, and ammunition. The night of the 30th was spent by the proper troops in selecting artillery positions and in making roads to them. It was very difficult to select suitable positions, and those finally chosen gave trouble on account of difficulty in getting ammunition to them. At 3 a. m. July 31 we moved out in the direction of Motienling, the commanding general having preceded us. We arrived at the new temple on the other side of the pass at 6 a. m., and were directed to remain at that point until the attack had developed. The Russian position was on the heights around Yangtzuling, which was the central point of a rather extended line with strong artillery positions. His force was said to be about five divisions in all, under command of General Keller, three regiments of which faced the Second Division. At 6.20 a. m. I first heard firing, and after some delay was permitted to advance to the height

C' to which point the attachés were limited in their advance. The day's work turned out to be an artillery duel and our position was a good one to observe the results. Three of the batteries of the Second Regiment of artillery were located at K and three on the farther side of the ridge at L. For some time after our arrival at our point of observation the firing was confined to the batteries of the division on our left. At 10.15 one of the batteries at K opened fire against the hills northwest of Tawan, and the Russian battery at G at once began an extraordinary series of shots, getting the range on the first bracket and driving the entire personnel of the Japanese battery to cover in five minutes. The Japanese battery was silenced for the time, but not put out of action permanently. The artillery firing along our front continued until noon, when all firing ceased. Our infantry had not advanced, and it was evident that there was a hitch somewhere. We had not been informed as to disposition of troops, plan of attack, or anything else, and had to work out our own salvation as best we could. The only infantry of our division visible to us was one battalion lying on the reverse slope of the hills near L, and these were not firing. The heat was frightful, the thermometer registering 122° F. During the lull at noon the Japanese battery which had been silenced changed its position about 50 yards, so as to get off the sky line. It was given out that difficulty in getting ammunition to the guns accounted for the cessation in firing. At 2 p. m. the artillery duel resumed with great vigor, and another of the Japanese batteries at C was silenced in a very short time with the exception of one gun, which kept to its work. At 3 p. m. the firing ceased, except for single shots now and then. In the meantime we were informed that the general plan of attack contemplated a turning of the left of the Russian position by the division on our left before we were to advance. At 4 p. m., the turning movement not having come off, the infantry of the Second Division was sent in anyway, two battalions advancing through Tienshuitien toward Yangtzuling under a heavy infantry and artillery fire from the Russian positions. The battalion near L deployed and went in, the gap between the battalions being filled by sending forward a battalion from the reserve. At 5.30 p. m. we saw the Japanese flag carried up to the tower at Tawan. Darkness coming on kept the division from reaching the central point at Yangtzuling, but upon renewal of the advance on the morning of August 1 they walked into the position without resistance, practically the whole Russian force having withdrawn during the night.

The casualties of the division, exclusive of the Thirtieth Regiment and part of the Sixteenth (which served during the day with the division on our right), were 86. On riding up to the Russian position I found one rapid-fire field gun, model 1900, overturned and lying against a tree up the valley about 100 yards above Tawan. The breechblock had been removed, but the gun was serviceable and was righted and carried off by the Japanese. This gun came from the gun pits at M, and on inspection of that position three dead horses were found lying on the ground, which can fairly be assumed to belong to the abandoned gun. It was evident that in escaping the gun got started down hill, the drivers losing control of it. It struck the tree and overturned, and had to be abandoned before the Japanese infantry advance. The shortage of horses was the probable cause of the lack of control of the piece during the steep descent.

Behind the works at N another Russian field gun, same model, was found, which was a complete wreck from artillery fire. The breechblock had been removed and a round of ammunition was still in the chamber.

In the Russian gun position at G were found 38 undischarged fused shrapnel abandoned in the gun pits. These were perhaps thrown out of the limbers in order to lessen the weight of the carriages in escaping down the steep hill in rear of the position.

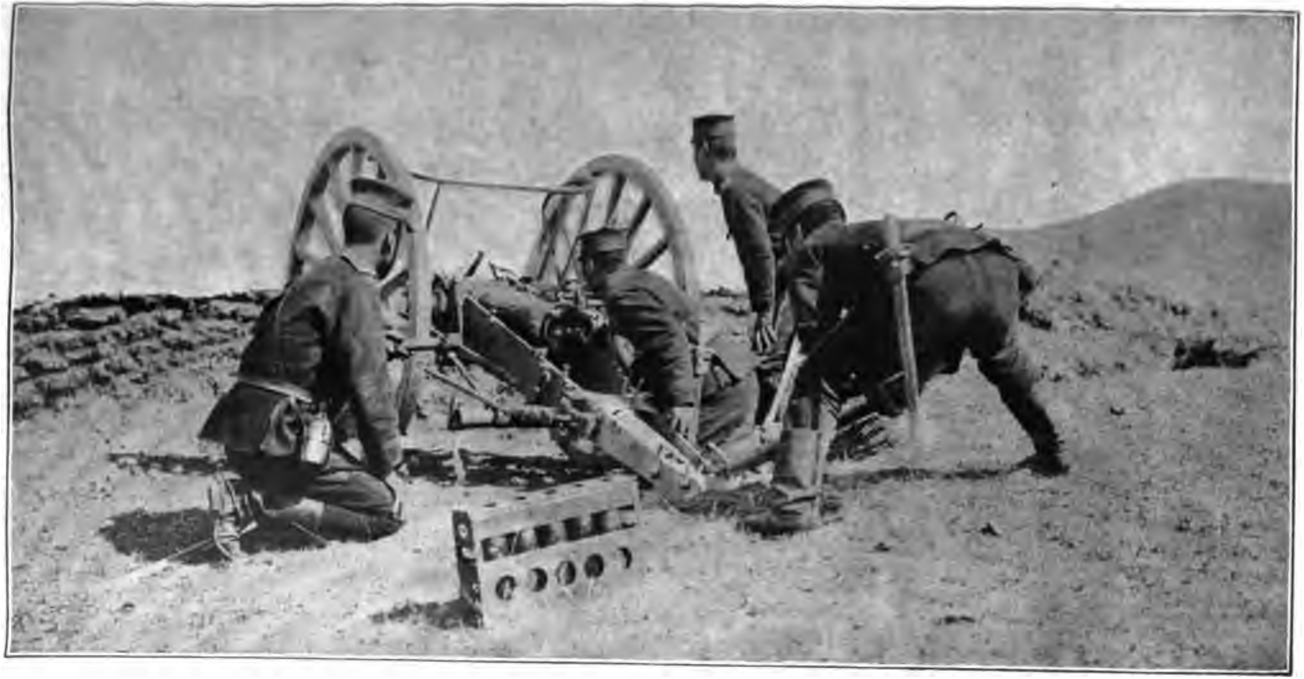
The Japanese lost no guns, and had, in the 6 batteries of this division, only 1 officer killed and 2 officers and 6 noncommissioned officers and men wounded.

The Japanese fieldpiece, called the "Arisaka," after its inventor, is a home product. Although generally referred to as a rapid-fire gun, it is really not one, in the correct use of that term. The following data concerning it are believed to be reliable:

Caliber	inches	2.95
M. V	foot-seconds	1,660
Weight of shrapnel	pounds	11

Number of rounds in limber		40
Number of rounds to section		120
Diameter of wheel	inches	55
Width of track	do	48
Axis of trunnions above ground	do	28

The gun is capable of only 6 to 7 aimed shots a minute. Separate loading is used, although the charge is contained in a brass case, which carries a cap in the base containing fulminate. The breechblock is of the single-motion, interrupted-screw type. It is fired by lanyard, which is attached to a firing pin which impinges upon the cap in the base of the cartridge case referred to above. The breechblock is hinged at the lowest point of the breech, and its motion is backward. The method of checking recoil is by a system of drag shoes which are attached to washers on the outside of the wheels by steel chains and to wire ropes on the inside, which pass around an enlargement of the axle and then are carried back to a lug on the side of the trail. The tube projecting from the side of the flask contains the traveling brake, which is a rather odd construction. A close examination of the photograph will show, hanging from the tube, a short cord. By pulling this the traveling brake, which telescopes in the tube, is drawn out until it comes into its proper position opposite the tires of the wheels. It is then applied by a cannoneer from the axle seat by means of a wheel and gearing. On top of the piece is the clinometer arc; this is inserted in a recess along the line of metal in a position convenient for the gunner. The sight, as has been stated, is a tangent sight, made of hollow steel, with a peephole in the head. The front sight is on the trunnions, the axis of which is in practical coincidence with the axis of the wheels. Elevation is given by the gunner by means of a horizontal wheel on a bracket on the right side of the carriage, which wheel moves a worm, which actuates a cogwheel operating upon a cogged arc on the right of the piece. The gun limber is of metal and is interchangeable with the caisson limber. It is divided into compartments carrying 4 trays, with 10 complete rounds to each tray, as does also the caisson body. A compartment in the center of the limber chest contains fuses, sights, spare parts, etc. During firing one of these trays or one ammunition box, according to source of supply, is placed on the ground outside the near



ARISAKA FIELD GUN.

wheel. The fuses are set at the gun. An inspection of shrapnel fuses picked up on the field after the artillery duel of the 31st shows that they read to fifths of a second and the greatest reading is eighteen and two-fifths seconds. It is of the dial type, carrying the time train in a movable ring. The wheels are very light, and, in fact, the weight of everything about the piece and its ammunition has been sacrificed to the horse, except the driver himself, who, curiously enough, has a greater minimum height and weight than soldiers of other arms of the service. Their horses are small, undersized brutes, mostly stallions, and driving together is a thing I have not yet witnessed.

The battery organization is much like ours with the 3.2-inch gun. There are three platoons, each commanded by a lieutenant; a platoon consisting of two sections, each commanded by a sergeant. A captain commands the battery. Batteries are organized into battalions of three batteries, each battalion commanded by a major. Two battalions form a regiment, which is commanded by a colonel. The regiments take their numerical designation from the division of which they are a part, and there are therefore 13 regiments of artillery with the active army. There are also two field artillery brigades of three regiments of six batteries each, which correspond to the corps artillery, so called, and which, in time of war, are under the command of the commanding general of the armies in the field. The regiments of these two brigades have numerical designations from 14 to 19, inclusive. There is one battery of artillery in the reserve of each division, or 78 guns with the reserve. The army in Formosa, which must be considered separately, has 42 guns.

Five of the artillery regiments are armed with the mountain gun (one of them has a mixed organization of two battalions of field artillery and an extra battalion of mountain guns), which is of the same caliber as the Arisaka and uses the same shell. The Formosa batteries are all mountain.

If a comparison is instituted between the Japanese and Russian fieldpieces, it must be evident at once that the Russian field gun is superior to the Japanese in every ballistic property. Without going into data about the Russian gun, it may be stated that it has an effective range of (roughly) 1,000 yards more than the Arisaka and can be fired (aimed shots) about three times as rapidly. There has scarcely been a single important battle in which the Japanese have not captured some of these Russian guns, so I have had opportunities of photographing them and of handling and examining their breech mechanism, which the Japanese naturally do not keep as secret as they do their own. The Japanese shrapnel, however, though much too light, is superior to the Russian in accuracy of burst and in type. The Japanese is the so-called "shooting" shrapnel. The charge is at the base, the sides of the shell being of extra thickness at that point. Its construction has no special features. The material is very tough, never failing to resist the charge within, except on graze, when sometimes the walls of the shrapnels were split longitudinally in two or three places, but even in such cases retaining their entirety.

The Russian shrapnel is very irregular on burst and gives surprisingly less killing than the Japanese for equally good shots, and in spite of its advantage in weight and number of bullets.

It would seem that the relative efficiency of the Russian and Japanese guns is certainly 6 to 4, if not 6 to 3, and would be greater but for the Japanese superiority in shrapnel. The Japanese artillery, however, makes up for its deficiency in equipment by a superb morale and extremely accurate gunnery and by taking every advantage of the character of the country it is operating in. Practically all the artillery work with this army so far has been firing from position against guns in position, and the lack of mobility of the Japanese artillery has not been such a damaging factor as it must be in work on the plains.

The superior range of the Russian gun has not been the dominating factor it should be as far as this army is concerned, because the Japanese have located the position of the Russian batteries, have selected positions for their own batteries within the effective range of their own gun from the Russian positions, and have then brought to the struggle two or three times as many guns as the Russians had in position. Their skillful gunnery and the accuracy of action of their time fuze, with their superiority in type of shrapnel, have done the rest. In open plains, where batteries can maneuver and where the Russian superiority of equipment might be taken advantage of, possibly my present judgment that the Japanese artillery is superior in gunnery, morale, and efficiency to the Russian may need revision, but it is unquestionable that at present the Japanese artillery does much for the troops with which they are serving. A great deal has been written about the moral effect of artillery fire upon the enemy and very little about its moral effect upon its own army. With the Japanese the latter is quite striking. In the battle of Motienling, July 17, 1904, the fire of the Japanese artillery, the effect of which could be plainly seen from the infantry intrenchments, was greeted by tremendous cheering shouts of "Banzai!" by the entire Japanese line along the crest of the pass. The physical effect of this fire was striking enough. I examined some fifteen or sixteen dead Russians at random at this point, and they all happened to be killed by shrapnel fire, but the encouragement it furnished the Japanese troops was palpable.

The Russians used no shell in the battle of the 31st, so I can not compare their shell fire with the Japanese. The Japanese shell is filled with a high explosive which gives on burst a yellowish vapor. The appearance, deposit, taste, and smell of this explosive as I found it on fragments of shells after burst strongly suggest some form of picrate. I was told by a Japanese officer of artillery that it was not the Shimose powder which is used by the navy in their shells.

The Japanese have no case shot, using shrapnel at zero for close work, nor has their gun carriage any shield. This war has solved the shield problem for the Japanese. In the absence of a proper shield they have extemporized one of hard wood about 2½ inches thick, which is carried in vertical iron frames attached near the trunnions. This shield is made of two pieces of equal width with hinges of leather nailed on at the joint, so that the top of the shield may fall over to the front and allow the use of the sight. This is primitive, of course, but there are holes of shrapnel bullets in some of them, bullets which have not come through, and the whole incident seems to me a rather interesting contribution to the argument as to the necessity and efficiency of shields with the modern field piece. It must be added that none of the Russian guns that I have seen have had shields of any kind.

The Russian shrapnel fire was largely in series of three or four shots, the series of three bursting in echelon with 50 or 100 yards between points of burst, but with very slight interval of time between the three shots, the series of four bursting in echelon in pairs. The greater part of the Russian shrapnel fire against the infantry was thrown away, the point of burst certainly averaging 500 feet above the line they were firing at. An examination of the Russian gun pits showed a vast improvement in construction, the cannoneers having head cover and ammunition pockets being constructed. These have been conspicuous by their absence in former specimens of their gun pits.

During this fight the Russians used a trick well known to veterans of our civil war. Near the tower at Tawan they had constructed intrenchments in which they had placed a battery of dummy guns. Logs of blackened wood resting on the axles of the wheels of Chinese carts from which the body had been removed, with the ends of the logs peering out into the valley, looked in the distance extremely like a formidable battery. Its effect, however, was exactly the opposite of what was intended, as I did not see a single shot fired at it, and the infantry advance of the left of the Second Division went straight at it, being sure, apparently, that there was nothing there.

We camped for the night of the 31st on the field, and in the morning, August 1, moved to Tienshuitien, where we have remained until the present time.

REPORT NO. 3.

FENSHAN, MANCHURIA,
October 5, 1904.

My report No. 2, dated Tienshuitien, August 15, 1904, left the Second Division of the First Japanese Army with headquarters at Tienshuitien, preparing for the final advance on Liaoyang. From the 17th to the 25th stores were brought up in sufficient quantities, and a depot of supplies established at Chinchiaputzu, just across the river. From August 14 to 22 it rained continuously, giving the first indications during the whole advance of what might be called a "rainy season." If the weather we have experienced during the alleged rainy season is typical, it is laughable to anyone who has served in the Philippines to dignify it by the name of "rainy" season. There has scarcely been a time when operations have been hindered in the slightest degree by rain in these mountains.

At 4 p. m. August 25 headquarters of the division left Tienshuitien and moved to Santaoling,[a] where we arrived about 6.30 p. m. and bivouacked for the night. The Thirtieth Regiment appeared during the march with white arm bands about 4 inches in width on their left arms. It was stated that this was for the purpose of adjacent files distinguishing each other from the enemy during night attacks.

At this time the general situation was as follows: Fifteenth Brigade, Second Division, at Tashiko; Third Brigade at Shechiaputzu, with the line of outposts along the hills from Huangnikou to Chingshuling. The Russians were at Chipanling, extending southwest to the hills northeast of Lantzushan.[b] The distance between the Japanese and Russian lines was about 3 miles, and the intervening country extremely mountainous. The objective for the Second Division was the position at Chipanling, the Imperial Guards having to deal with the Lantzushan problem. The country between the Second Division and the Russian position had been thoroughly reconnoitered during the wait at Tienshuitien, and it was found that a night attack was necessary, as suitable positions for the artillery could not be found for the preliminary work and a day attack by infantry alone too dangerous. Daily patrols had been sent out—largely by night—for a week preceding the night attack to the position the division was to attack, so that the ground became thoroughly familiar to the officers and men. In order to deceive the Russians, patrols were sent in other directions, one to Hotai, which returned after developing the enemy and driving in his pickets.

Plan of night attack: Fifteenth Brigade, less two battalions, Thirtieth Regiment, accompanied by two companies of pioneers, three batteries of artillery, and one-half sanitary detachment, to occupy the position at Huangnikou; Third Brigade to occupy position at left, moving from Uchialing to Sashiko. Two battalions, Thirtieth Regiment, one battery mountain artillery, and one company of pioneers formed the reserve.

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[a] Sheet No. 2, map No. 2.

[b] Sheet No. 1, map No. 2.

The right wing assembled south of Huangnikou at 4 p. m. on the 25th, the left wing at Hoyu and Uchialing, both remaining until sunset, when the advance began to the second assembling positions, the right wing at Kakahoshi, the left at Kami (upper) Okahoshi.

The left wing found the Russians on the hills south of Sashiko and drove them back, reaching Sashiko at 3.30 a. m., 26th. The right wing began its advance earlier than the left because of the longer distance it had to march, and the plan of attack called for an attack by the whole line at 4.30 a. m. on the 26th. Two companies of the right wing were pushed forward along the Tsuekou road and opened fire to create a diversion from the main point of attack. The body of the troops were instructed not to open fire without orders. At 3.30 a. m. the firing was continuous, principally Russian. The moonlight was very bright and to the advantage of the Russians, as they saw the Japanese assembling at the third position and opened fire upon them. The first Japanese line advanced rapidly and without hesitation, using different formations in different points of the line, as seemed most suitable to the commander on the ground.

The reserve of the division moved up to Kami Okahoshi, the mountain battery going into position southeast of Sashiko, and prepared to go in if the attack was repulsed. At 4.30 a. m. the entire line was in motion and at 4.40 a. m. carried the position by rushes. The hardest fighting was in front of the Fourth Regiment, which lost its commanding officer and had two battalion commanders wounded, the entire casualties at that point being about 700. At the same time the right wing rushed the Russian left, driving their troops back upon Tsuekou, and the whole Japanese line pursued vigorously. At 4.40 a. m., then, the Japanese held the Russian position, while the Russians still held the hill south of Tsuekou and bombarded the Japanese by two batteries of artillery, one northwest and one southeast of Tsuekou and also from batteries located east of Anping. The Japanese mountain guns advanced to the captured position at 8 a. m., but the field guns could not get up.

This movement was to coordinate with the advance of the Guards upon the Russian position north of Lantzushan. The Guards, however, had failed to take their hill up to this time, so the Russians on the hill south of Tsuekou still held. They seemed to be one battalion. The division commander sent up one company against them and followed it by two more, all from the Thirtieth Regiment in reserve, but the Russians still held. Two mountain guns were then brought back from the captured Russian position to a position in the valley near Sashiko, from which they could fire at the Russian hill. These guns opened at 10 a. m. with shrapnel, and after firing these for half an hour changed to their high-explosive shell. In less than ten minutes after the Japanese began using this projectile the Russian infantry began to break and leave their trenches, and the Japanese infantry, charging up the hill, occupied the position. An examination of these trenches after the fight showed them full of Russian bodies with heads, arms, and legs torn off, lying in heaps, so that it was impossible to tell to what body the members belonged. The effect of this shell is enormous, and we were destined to see exactly the same effect produced by it later—i. e., entrenched infantry break under it.

The Russians in front of the Second Division were now in full retreat. The Twelfth Division, on the right of the Second, had reached Hungshaling, while the Guards, on the left of the Second, were still having trouble with the hill north of Lantzushan. The Russians in our front were retiring toward the Tang River, but still held the high hill, marked on map as being 2,070 feet high, slightly southwest of Tapinko.

At 2.45 p. m., the fire having ceased for some time, the Japanese mountain battery packed and started along the sky line toward their left, which would bring them out on the trail connecting Sashiko and Tapinko. A Russian battery, invisible in the distance, promptly opened upon them and forced their withdrawal down the hill, coming out eventually at Sashiko.

We stopped at Sashiko for the night and found the village packed with Japanese wounded. These men were curiously active in spite of their wounds, men shot through the head, neck, body, arms, and legs being observed walking around or hopping around, as the case might be, cheerful and lively and indifferent to their wounds. They showed extraordinary vitality, with a noticeably less amount of nervous shock from wounds than I have observed in American soldiers whom I have seen similarly wounded in the Spanish war and the Philippine insurrection.

During the fight of the 26th, signaling by semaphore flags was carried on between division and army headquarters. Two sets of the small hand flags were used, one being white and the other red with a narrow white border. Most of the Japanese communication on the field is by field telephone, and, in more permanent installations, by telegraph. The telegraph detachment is extremely efficient, keeping up with the army at practically all times.

It rained heavily the night of the 26th, and on the morning of the 27th a very heavy fog obscured everything. Numbers of wounded Russians were seen having the numbers "34" and "36" on their caps, showing the regiments.

As the movements of the division were a part of the advance of the entire Manchurian army on Liaoyang, the division orders were to press on by daybreak. Reports came in that hill 2070 was in the hands of the Japanese, but these were in error, as in the rain and fog the detachment had got on the wrong hill. The fog obscured everything, and the advance had to be delayed. During this delay reconnoitering parties were sent out toward the Russians. Off to the north in the heart of the fog, artillery was firing, but nothing could be seen. At 3 p. m. the fog gradually lifted, and the Japanese batteries near Chipanling began firing at Anping. Across the river and in the open flat space near Sangomiao there appeared large masses of Russian troops, tents, and a pontoon bridge across the river which was being used by a steady stream of Russian troops retreating before the Japanese advance. Another large column of Russians was retreating before the advance of the Twelfth Division and was passing Hanchiatun. There seemed to be about two Russian divisions. At 5 p. m. Russian batteries in position on the left of the river opened fire to cover the crossing of the river; their cavalry and transportation began to ford; the retreat quickened, the last horsemen galloped furiously up and flinging themselves into the stream. The tents were struck, and the troops on the flat began to move back toward Liaoyang.

The Second Division advanced with the Twenty-ninth Regiment along the ridge of hills connecting hill 2070 with Tapinko, the general advance of this brigade being toward

Sanchiasai, the Twenty-ninth on the left and the Fourth on the right. In the right wing the Sixteenth Regiment was southeast of Anping and on the left of the road, and one battalion of the Thirtieth Regiment was on the right of the road. During this movement there was little resistance by the Russians. The fog had helped them to get away. We moved down the mountain, coming out at Tapinko, where we camped for the night.

On the morning of the 28th we found the Russians entrenched on the hills near Sanchiasai. Early in the morning most of the attachés pushed forward until we emerged on the crest of a hill about 1,200 yards from the Russian position, from which the valley of the Tang River was visible from the main Liaoyang road to beyond Anping. The Russian entrenchments were filled with men; Cossacks were moving to and fro along the valley. Near Anping three batteries of Japanese field artillery were in position, while to our left and a short distance away was one Japanese mountain battery in gun pits. The Japanese artillery preparations had been completed during the night, and the batteries were in position before dawn. The river was not fordable at all points, and a preliminary bombardment was necessary before the Japanese infantry could attempt the fords. Far away to the northwest, in the general direction of Liaoyang, on the hill called "Shoushanpu," a heliograph kept constantly communicating messages to the Russian forces in front of us.

At 9.10 a. m. the Russian artillery at A, consisting of eight mountain guns, opened fire, and an artillery duel between this battery and the Japanese battery at B ensued, resulting in the temporary silencing of the Russian guns at 10.15 a. m. The Japanese battery then turned its fire upon the infantry intrenched to the left of the village of Sanchiasai and at 10.25 a. m. this infantry broke and ran to the rear, one of its officers, conspicuous in his white coat, starting in advance of his men, and gaining on them as they fled.

At 11 a. m. a Russian battalion moved up to the position C in skirmish line, but were immediately fired upon by the Japanese artillery at D, and at the second shrapnel, broke and ran for cover, pursued by a hail of shrapnel, the battery at D immediately opening rapid fire.

At 11.30 a. m. the order was given for the infantry to advance.

During the whole morning the Russian infantry had been firing volleys but at such long ranges as to be ineffective. As the Japanese infantry came out into the open to cross the river, their artillery poured a heavy fire upon the Russian intrenchments, and the Russian battery after attempting a few shots withdrew. The Japanese infantry of the left brigade deployed into firing line, supports, and reserves. The supports lay down on the sand and covered the crossing of the first line by rifle fire. The men were about four paces apart. The first line went into the river and moved steadily across with large intervals—I should say, six paces—without much bunching, in the face of a heavy infantry fire, which kept the water splashing up around them, but which was surprisingly ineffective. The men emerged on the other side, formed, and advanced against the Russian trenches.

The right brigade, in the meantime, marched out into the open at Anping, in column, there being no resistance. They threw a point of a dozen men across the stream and followed it by the whole column, which was across by 1.35 p. m.

At 3.30 p. m. the Russians had retired along the whole front, and the firing had ceased except on the extreme left, in the direction of the Guards.

At 7.40 p. m. headquarters moved forward to Sanchiasai, which we reached at 9 p. m. and remained for the night. As the ridge of hills upon which the Russians had rested was our real objective, the division was ordered to press on and take them by night attack. The Third Brigade occupied its designated position with slight resistance, but the Fifteenth Brigade found the enemy too strong in front of it, and quartered at Sanchiayu for the night.

August 29 there was no special action. The Third Brigade on the left could not advance, because it was to keep touch with the Guards on its left, and they had not come up. The Fifteenth Brigade reached Shihtsuitzu at noon without resistance. Headquarters with the reserve (two battalions, Thirtieth Regiment) reached Kinchiatunhsikou at 1.55 p. m., where we stayed for the night. Heavy artillery firing had been heard all day to the northwest. On our front the Russians were holding the line of hills nearest Liaoyang and had two batteries of artillery near the river north of Chututai. They also had artillery on the hills across the river north of Hsiaomiao, which had an effective flanking fire upon our position. These batteries kept up their fire after nightfall, aiming at the Japanese camp fires, and especially after midnight, when the moon came up.

August 30 the division held the same general position, the left slightly advanced to keep touch with the guards, and the right wing refused. The reserve fell back to Sanchiayu, where headquarters stayed that night.

Early in the morning we went forward to the top of a peak from which the entire front of the Japanese armies and the Russian positions around Liaoyang were visible. From this point, as the eye and glass began to pick up the masses of Russian troops, it was evident that this was to be no rear-guard action, but a titanic struggle between great armies of probably equal strength, with the advantage of position lying with the Russians. Every village swarmed with their troops, every grove of trees had horses in its shade. In the open spaces all over the landscape the white tents of their camps were visible. In the left center, midway between Liaoyang and Shoushanpu, a captive balloon was floating lazily about 1,000 feet up; five military bridges crossed the Taitzu River in the vicinity of Liaoyang; on the railroad sidings near Liaoyang the smoke of numbers of locomotives was visible, while to the north trains were coming and going. Across the Taitzu a large cavalry encampment appeared, in addition to masses of infantry; from a semicircle along the low-lying hills from Shoushanpu across the river to Manjuyama, sounded the incessant roar of the Russian batteries. The Russian batteries along our immediate front searched the hills with occasional shots, but got no reply. The fighting was mainly to our left, where the Second and Fourth Japanese armies were advancing. The artillery duel kept up all day, and when we went to our quarters for the night there was no indication that the attack had made the slightest advance. During this time the Second Division was reconnoitering the roads and fords of the river preparatory to crossing to the right bank of the Taitzu. The commanding general had only half his division for this movement, as the left brigade had to hold the line from the Guards to the Tang River. Pioneers were sent out at 5 p. m., who repaired the roads damaged by the slight rain of that day. The division assembled at Kusaochin at 10 p. m. with orders to cross the Taitzu in rear of the Twelfth Division. The Twelfth Division did not clear until 2 a. m. of the 31st, when the Second Division took up the march, proceeding through Heiyu and crossing the river at Lientaowan at 6 a. m. the 31st. The river was waist deep and quite swift, but the infantry locked arms and got through. The artillery was pushed up on the left bank to Tiosulu. At 3 p. m. a pontoon bridge was constructed at Goyo by the Twelfth Division, and during the night of the 31st five field batteries crossed the river and went into position.

During the entire day (31st) the artillery duel kept up. At 8.45 a. m. a Russian battery, preceded by cavalry and escorted by infantry, moved out through Kouchingtzu to Tatuntzu, evidently to develop our front. This battery came into action in the open, along the road, and fired a few shots, as did the Russian battery at the river near Hsiaopu, but there was no reply. The fighting was raging in front of the second army and the fourth army, and troops were moving up to the assistance of the threatened Russian positions. Their cavalry crossed the river from the right to the left bank, taking forty-five minutes in crossing. Heavy infantry fire was now audible on the left; but again at night no evidence that the Russians had been driven back the slightest amount.

The movement upon which the first army had now entered was the turning point of the battle and was a bold and hazardous undertaking. General Kuroki had left half of the Second Division to form a light containing force along the line of hills which the division had been occupying and the Guards to keep touch with the fourth army on the left, and had thus placed this army astride the stream in the face of a vastly superior Russian force. His chief of staff was asked frankly how he dared do such a thing, and his reply was, "If this was the first battle of the war, we would not do it, of course. But we have fought the Russians many times now and know we can attempt such a movement safely." This is a very important statement and indicates quite clearly the relative morale of the two armies at the time of this battle.

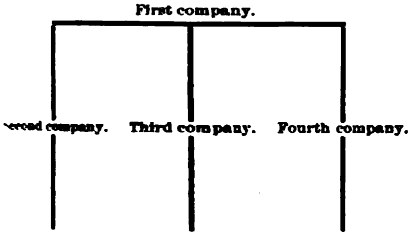
Concerning the fighting which we witnessed on September 1-3, General Okasaki, who commanded the Fifteenth Brigade, Second Division, gave us a talk, which is so interesting that I reproduce it as nearly verbatim as may be.

"The Fifteenth Brigade crossed the Taizu on the 31st of August, and at 4 p. m. received orders to watch the line between the river near Kuantun and Chuankufen. The Twelfth Division was on the right of the brigade. The artillery had not then arrived, but four batteries arrived the same day and took position behind the brigade. The brigade had orders to advance on the morning of the next day in the direction of Manjuyama, together with the Twelfth Division. The brigade had only five battalions, because two companies of the Sixteenth Regiment were at Shihtsuizu, and one company at Kouwai because two batteries of artillery were between Kouwai and Tiosulu, the road being very bad. The Russian infantry was very near the line of outposts of the brigade, one Russian battalion being on the hill west of Chuankufen and intrenched. At 5 a. m., September 1, the Twelfth Division started and the Fifteenth Brigade at 6, moving toward Manjuyama. The brigade arrived at the rear of Chuankufen and sent forward the advance guard, which encountered the Russian battalion and were fired on by ten Russian guns near Hsikuantun. At 6.30 a. m. the Japanese artillery opened fire upon the Russian guns and the artillery duel began. I stopped my brigade and ordered that the Thirtieth Regiment should move by the right and turn the Russian battalion on the other side of Chuankufen. When the Russians saw this movement, they retired. The brigade then deployed in the kaoliang, with the Thirtieth Regiment on the right and the Sixteenth on the left.

"At 8 a. m. the Russian battalion had completely withdrawn and its position occupied by the brigade—northwest of Chuankufen. One company of the Sixteenth Infantry was put on the road to Hsikuantun, near the river, with some cavalry to keep the Russians from coming down by the road. It was the Twelfth Company of the Sixteenth Regiment. I could not advance, because the Twelfth Division could not, being opposed by a strong force, so I remained where I was until the afternoon. At 1.30 p. m. I received word from the

Twelfth Division that a large Russian column was moving in the direction of their right, coming from Yentai mine. I replied 'I am too near the Russian position and can not remain here without advancing and must continue fighting.' I knew of the operations of the second and fourth armies, and that it was necessary to try to cut the Russians off. At this time there was a small Russian force on Manjuyama. It was possible to occupy it without danger, and I made the decision to attack, but before attacking I asked the commanding officer of the artillery regiment to fire at Manjuyama (this commanding officer was not under me) and wrote to headquarters of the Second Division that I must attack and would after the artillery preparation. I also wrote to the Twelfth Division for their mountain artillery to concentrate their fire on Manjuyama. The commanding officer of the Second Artillery Regiment replied 'yes,' but it would be necessary to change the front of his regiment, which would take some time, because the fire of the Russian batteries did not permit a quicker movement. In this way the time passed until 4 p. m.

"At this time eight Russian guns appeared at Yanchiatun and eight guns at Choheiyentai. Then the Russian artillery was superior to the Japanese without the Twelfth Artillery, and it was necessary for them to assist. They were quite near. At 4 p. m. the headquarters of the Second Division informed me that headquarters of the army had decided to occupy Manjuyama that day and that Kigoshi's brigade (Twelfth Division) should aid the Fifteenth from the rear, if necessary. An adjutant of Kigoshi's came up for information. I told him Kigoshi should watch the right flank of the Fifteenth Brigade and try to approach the Russian battery at Choheiyentai north of Manjuyama and make it retire. In the evening, between 6.30 and 8 p. m., the field and mountain batteries fired very heavily against Manjuyama, and I hoped the Russians had retired, but they did not and were reinforced. When darkness came, the artillery fire ceased, and the brigade in the kaoliang began to advance. It was the first time we had fought in the kaoliang, which I think assists an attack, with care. The moon had not yet risen and it was very difficult not to lose direction and to keep in touch. I gave these orders for the march. Each battalion must dispose itself like this:



"The men were quite near each other, and each officer with a compass. In this formation they arrived at the foot of Maujuyama, and began the ascent. When the brigade arrived at the point where the kowliang was cut, I stopped the brigade and turned the first line by the flanks of the position on the hill. I saw the ground before the Sixteenth Regiment was very difficult, while the ground before the Thirtieth was easy, so I ordered the Thirtieth to attack at once. At this moment I heard the noise of a charge in the first line of the Thirtieth, and afterwards shouts of 'Banzai!' and a messenger arrived with a report that the Thirtieth had occupied the position on the northeast part of the hill. I sent to the Sixteenth Regiment the order to attack, and in a little while received the report that the Sixteenth occupied the southwest of the hill. It was very dark, and the Sixteenth did not know the Thirtieth had taken the other half and asked permission to take it. Before the attack on the hill the brigade had received reenforcements, three companies of the Fourth Regiment, and I ordered these three companies to reenforce the right flank of the Thirtieth Regiment; but, finding the Thirtieth had taken the hill, I sent them to the Sixteenth, and they remained there.

"The hill was occupied between 11 and 12 p. m. by the Thirtieth Regiment, about half an hour before the Sixteenth. Some minutes after 12 o'clock there was a counter attack against the Second Battalion of the Thirtieth Regiment, which was in the first line.

"This counter attack lasted half an hour, and the Russians left 1 lieutenant-colonel and many soldiers dead on the field. In a little place there were 40 dead. I then sent some officers' patrols to see where the Russians were going, and these patrols reported that the Russians fell back on Sahutun and Choheiyentai. I ordered the Sixteenth and Thirtieth regiments to intrench, and also to construct casemates for sleeping and protection, in preparation for the morrow against artillery fire. Patrols informed me that the Russians had withdrawn also from the artillery positions near Hsikuantun. I sent an officer's patrol to verify this, and it reported that the positio was not occupied by the Russians; so I ordered three comp nies of the reserve to ccupy this position, with instructions retire in case retention of that point was difficult. I saw th Manjuyama was well intrenched and then came down.

"At 8 a. m. the next day (September 2) I went to the t of the hill. At the same time Major Watanabe, of headqua ters, came with a message from General Kuroki that he w very well satisfied with the occupation of Manjuyama. replied that it was necessary to do something against the Ru sian artillery. Sixteen Russian guns were north of the hil and three Russian heavy guns had taken position on a spu of the hill marked "910 feet," near the river—perhaps 1 centimeter guns—and some guns were near Sahutun; but th three heavy guns were especially dangerous because the took Manjuyama in flank.

"At this moment the Russians opened fire, a little short but it wounded Ito, my adjutant, and then all the Russia artillery began a rain of fire, making it impossible to stay o the hill. All the soldiers were on the bottom of the intrenchments, and Major Watanabe and I came down to a pit where Colonel Baba, of the Thirtieth Regiment, was, and we stayed there half an hour without moving. There were few casualties, because all laid down. Then the Russian artillery distributed their fire, but some guns continued to fire at Manjuyama, and it was not possible for the soldiers to get food, fire, or water. They had to stay in the intrenchments and eat uncooked rice. During this fire I believed the Russians would attack, either then or at night. Their fire was very rapid, sometimes 10 shots a second from the more than 40 guns around the hill. At 11 o'clock the Russians occupied the hill (910-foot). I sent an order to the battalion of the Fourth Regiment to retire. The Russian intrenchments there were in a semicircle facing Manjuyama. They were also reenforcing Sahutun, with the idea of attacking Manjuyama. Then all the Russian artillery fired on Manjuyama, and I knew it was the preparation for an attack. The Japanese artillery could not change position to approach the Russian artillery. I went to the side of the Sixteenth Regiment and took with me the Second Battalion of the Thirtieth Regiment, which was the reserve of the brigade. When I arrived there

I saw that the Russians had stopped at Sahutun. I received a message from the commanding officer of the battalion of the Fourth Regiment, asking permission not to retire. I replied, 'Not possible,' adding that I was sending two companies to assist during the retreat.

'The two companies lost 100 men and the three companies of the Fourth 170 men during the withdrawal. In the afternoon I sent this battalion back to Chuankufen, and the headquarters of the Second Division put the battalion in the reserve of the division, and one battalion of the Twenty-ninth Regiment was sent to reenforce the brigade at the same time.

'The soldiers on Manjuyama were very tired, even sleeping under fire, the snoring of men being heard between the shells. The Russians on hill (910-foot), when they occupied the position held by the Shimodayashi battalion (Fourth Regiment), stopped their advance. When I saw the Russians did not attack, I thought of attacking myself, and went to the top of the hill. I saw there that the Russians were occupying a long line between hill (910-foot) and Sahutun, extending toward the north and surrounding Manjuyama. I saw it was impossible for me to attack, so awaited the Russian attack.

'The Russian artillery fire against Manjuyama stopped after 6 p. m., and I filled up the entrenchments with men. I gave the battalion of the Twenty-ninth as a reserve for the Thirtieth Regiment. During this night there were five attacks; the first, between 7 and 8 o'clock, against the left of the Thirtieth Regiment, very severe, made by two battalions of Russians. We repulsed this attack, but had to bring up the reserve. After a few minutes the second attack took place, against the right flank of the Sixteenth Regiment. This was repelled by the first line, the Russians falling back only about 200 yards and continuing firing. The moon had not risen. I went on top of the hill. The two lines were firing, and it was not possible in the darkness to tell which was which, so near to each other were they at places. Toward Sahutun we heard a Russian band playing a march, and near Choheiyentai heard the Russian war song. This was about 9 p. m. I ordered my trumpeter to sound 'Cease firing.' Then the Japanese stopped their fire, and I saw the Russian line, and called to my soldiers in a loud voice:

"'When my soldiers are so well disciplined as to cease fir during a fight, it is impossible that the Russians can tak Manjuyama. I am here to see you. Never can the Russian occupy Manjuyama.' The soldiers cried, 'Banzai!' A officer came and asked permission to fire, as the Russians wer very near. I called out, 'It is foolish to fire when you can no see the enemy. Wait until he is near and you are right t fire.'

"At 10 p. m. the third attack came, a rush against the Sixteenth Regiment. I went to the side of the Sixteenth and saw it was a very strong attack, the Russians leaving the colonel of the One hundred and twenty-third Regiment and 300 officers and men dead there.

"After a little the fourth attack took place against the Thirtieth Regiment. This was repelled by the first line.

"At 2 a. m., September 3, the commanding officer of the Thirtieth Regiment sent me word that a large Russian force was coming, I went on the hill and saw by moonlight a long, black line at the foot of the hill, surrounding all the hill. Colonel Baba (since promoted major-general) proposed a counter attack with the right wing of his regiment (Thirtieth) against the left flank of the Russian line. At the time my whole force was 6½ battalions, 1 company of troops in rear having come up. The reserves were brought up on the firing line. At 2.30 a. m. Baba, with two battalions of the reserve, began an attack against the Russian left flank, while the whole Japanese line opened a heavy fire. Seeing this movement, the Russian line fell back on Choheiyentai and Sahutun. Colonel Baba proposed pursuit, but I refused, as I did not know the general situation. I therefore sent out patrols, who reported that the Russians had stopped at Choheiyentai and Sahutun.

"In the morning the Matsunaga brigade (the Third, which had been left on the left side of the Taitzu) assembled northwest of Chuankufen for the purpose of assisting my brigade, and also for the purpose of attacking the Russians before daybreak. But when they assembled it was too late.

"During the night part of the Japanese artillery changed position to two places, one northwest of Chuankufen and the second southeast of the same place. When they began to fire the heavy Russian guns retired, and then Manjuyama became more healthy. But the Russian artillery north of Manjuyama kept up their fire during the 3d of September, without any infantry attacks.

"The casualties during the three days' fighting were: Killed, 11 officers, 228 soldiers—total, 239; wounded, 33 officers, 1,012 soldiers. total, 1,045; total casualties, 1,284.

"Of these, the Sixteenth Regiment had 368; the Thirtieth, 671: the Twenty-ninth and Fourth, 245.

"Of the dead and wounded, between one-seventh and one-eighth were by artillery fire, the rest by infantry. The Russian artillery fires very rapidly, but the point of burst is very variable during quick fire. I do not know the strength of the Russian force opposed to me, but prisoners said it was four regiments and more than 40 guns. We took very few prisoners. and they were wounded. I think our system of fire for field artillery is good and requires no change. In fact, there are no material changes necessary in our regulations, except for the transport service. It would be an advantage to substitute biscuit (hard-tack) for the dry rice ration, as it is not always possible to cook the rice. I should say there should be no changes in the tactics of infantry either. Sufficient latitude is now allowed subordinate commanders as to the distance between files in extended order to meet all requirements. During the three days' fighting the brigade expended 423,600 rifle cartridges."

During the 3d of September the division did not advance an inch. A steady fire kept up all day from the Russian batteries and no attempt was made by the division to advance.

The 4th of September opened with a heavy mist, which cleared about 11 a. m. The Russian artillery fire was desultory, and they were reported as having retired from hill (910-foot.) No advance was made during the day. At 6 p. m. General Watanabe, with his brigade of the Guards, passed us, going forward to reenforce the Second Division. We started forward at 8 p. m. and marched until 10, slowly moving with a long column of troops in the darkness, until we arrived at Chuankufen, where we stayed for the night.

On September 5 the battle of Liaoyang could be said to be over, and we were allowed to go to the top of Manjuyama, which by that time had been cleared of the Japanese dead and wounded, leaving only the Russian. On the crest of the hill there were 236 dead Russians, lying almost in regular ranks, the position of the farthest bodies showing that the wave of the Russian advance had passed over the crest to the Japanese side. The crest must have been taken and retaken several times; everything bore witness to the fury of the conflict on both sides. The Japanese side of the hill was honeycombed with pits and trenches; the ground was covered with every variety of weapon and military implement—hand grenades, high-explosive shells, empty shrapnel cases, rifles, swords, drums, bugles, shovels, bayonets, all in inextricable confusion. The caps of the dead Russians showed that they belonged to the Tenth, Thirty-third, Thirty-fifth, Eighty-fifth, One hundred and twenty-first, One hundred and twenty-third, One hundred and thirty-third, One hundred and thirty-fourth, One hundred and thirty-fifth, One hundred and thirty-sixth, One hundred and thirty-seventh, One hundred and thirty-eighth, and One hundred and Thirty-ninth regiments. So it can be fairly said that General Okasaki's estimate of four regiments opposed to him was too small, although, of course, it is not likely that the regiments represented by these members were all present in their entirety.

After a careful examination of the Russian positions around Manjuyama and Hill 910, we pushed on after the division, arriving at Huntuyaitzu[a] at 5 p. m. Here we remained until September 9, when we were recalled to the headquarters of the first army at Fenshan, near Liaoyang. During the time from September 9 to the date of this report we have studied the positions around Liaoyang, and examined the redoubts, entanglements, and means of defense used by the Russians.

GENERAL OBSERVATIONS.

1. *Japanese mountain artillery.*—These guns are transported as follows: One pack pony to the gun, which travels with the sponge and rammer staff inserted in the muzzle of the gun; 2 ponies to the flask, which is in two sections; the shafts, which are used when traction is possible, are with the first section; 1 pony with ammunition follows the piece and carriage. After the 24 ponies, necessary to carry the 6 pieces of the bat-

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[a] Sheet No. 4, map No. 2.

tery, together with the 6 ammunition ponies, follow 48 ammunition ponies, thus giving altogether 9 ammunition ponies for each piece.

2. *Field hospital service.*—Each wounded man is given at first treatment a red tag marked with his name, company, regiment, and diagnosis, and sent back to the field hospital, where he is again examined, and if he is admitted is given a white tag similarly marked. His gun and equipments are also tagged. As the number of wounded in battles of these dimensions is entirely beyond the capacity of the tents furnished, villages are usually taken possession of for field hospitals. The following observations of a Japanese surgeon in charge of a field hospital are recorded:

> The Japanese bullet is much more humane than the Russian, although both are very markedly so. The bullet kills if it strikes a vital spot, but patients with five or six wounds recover if a vital spot has not been touched. The character of the wound also depends on the distance. Wounds received at distances of from 110 to 550 yards are very serious; from 550 to 1,330 not serious; farther than 1,330 yards very serious, because the bullet no longer strikes exactly straight, but goes in slightly sidewise, the Russian more so than the Japanese. Average of casualties has given 1 dead to 7 wounded. The worst wounds are Russians wounded by the Japanese picrate shell.

3. *Transportation.*—The Japanese transportation is by four principal methods: 1, regulation transport cart; 2, Chinese cart; 3, pack pony; 4, cooly.

a. The transport cart is a two-wheeled vehicle having a platform 6 feet long and 2½ feet wide, carried on an axle 18 inches clear of the ground. It has in front a skeleton framework of iron, upon which the driver sits. It is bound together and braced by iron bands. Its weight with harness is 400 pounds. Its load is 400 pounds, also, made up usually of parcels of thickly woven matting containing 70 pounds of rice or 40 pounds of barley. The Japanese pony, which will not average over 800 pounds in weight, hauls his load 12 to 18 miles and returns empty as one day's work. A pony lasts about twenty days at this work and then is given a lay-off. Sore backs develop quickly, but the ponies are not used when this is so, but are turned over to the veterinarian promptly. The daily ration for the pony is 8 pounds barley, 8 pounds hay, and 8 pounds straw, but he doesn't get it. On the 19th of August, and thereafter for some days, they were fed on wood shavings, which will scarcely keep even a Japanese pony in good condition.

b. The Chinese cart is merely a body balanced on an axle with heavy wheels studded with nails. They harness to this cart the most extraordinary combinations of animals, a bullock, a cow, a mule, and a Chinese mare followed by her foal being frequently seen harnessed together. They average 1,300 pounds for their load, and are driven with remarkable skill by the Chinese drivers, with their rope harness and odds and ends of horse equipment.

c. The pack pony carries food, ammunition, or hospital supplies, the latter two in chests of standard size. Rice he carries in matting bags about 200 pounds weight to the pony, which is rice enough for 100 men, the daily allowance being 6 *go*, or 2 pounds, per man. This calculation gives 30 ponies to a regiment. The ammunition box carries 1,200 rounds, or 2,400 to the pony. The ammunition train is calculated to double the supply carried by the regiments. Each man carries 140 rounds. When he goes into a fight he takes off his knapsack and puts cartridges enough into his pockets to bring this number up to 200. The method of getting the reserve ammunition to the firing line I have described in a previous report. As an example of how it works, it is stated that by the evening of the fight on the 31st of July the Guards had fired 200 rounds per man, and still had in their possession 200 rounds apiece, which had been obtained from the train.

d. The cooly cart is the ordinary handcart with straight, short shafts joined by a crossbar, and weighing about 200 pounds. One man pushes on the crossbar, one behind the cart, and one, or sometimes two, help—either drag with ropes or push. They transport 300 pounds 15 miles in one day and make the return empty-handed. These men are all uniformed, and are composed of men who were in the last draft, but who were not needed for military service. They are of splendid physique, and handle their cart with ease, like the 'rikisha in Japan. I am informed that their sick report does not show over 2 per cent of sick.

Before we had left Lienshankuan in July we knew that the Japanese had built a field railway from Antung to Fenghuangcheng, thus putting their base of supplies at the latter place. This railroad has been pushed on, and although data are not available can fairly be supposed to be nearing Lienshankuan. Auxiliary bases with depots were established during the advance at Lienshankuan, Chinchiaputzu, and Anping, and the supply of the army kept up, regardless of difficulties of the terrain or the presence of the enemy. This work was first class in every respect. The transport system, as I have indicated, is not what any other power uses and is obviously defective in many ways; but it did the work in this mountainous region, and that is what counts.

4. *Sanitation.*—The Japanese during the advance took very few precautions with regard to sanitation. The men were always, when possible, quartered in filthy Chinese huts in preference to the open; springs of fresh water were soon polluted by soldiers washing their mess tins and clothes in them; animals were slaughtered near where the men lived, and the skins and frequently the entrails left to rot on the ground. Many of the men whenever we came to water were observed drinking it unboiled. The Japanese soldier himself is very clean, always washing himself at every opportunity, and in spite of the defects noted above the sick report of the command was very small, being for the Second Division, for instance, for the month of April 5.25 per cent, for May 4.4 per cent. As we advanced, however, practically all the men in the hospitals were wounded, although beriberi developed to some extent. In clearing up a battlefield the Russian dead were always buried, usually under the direction of the Japanese, by Chinese burial parties, who scraped a shallow hole in the ground, put the corpse in, and threw on a layer of earth. The Japanese dead were cremated as far as possible. When the number of dead was too great or there was a scarcity of wood they were buried. Of course in a continuous advance there were many corpses of men who had crept off wounded into thickets and had died there whose bodies were not discovered by the burial parties, and whose existence was detected later from the odor arising from decomposition.

5. *Gun slings.*—In connection with the discussion of the advisability of doing away with the gun slings in our infantry, it is noted that the Japanese infantry has the gun sling and that it is always worn loose. The rear point of attachment is in front of the magazine and trigger guard, so that it does not interfere with using or loading the piece. The infantry

march a great deal with the gun slung. The cavalry habitually carry their guns slung diagonally across their shoulders when mounted.

6. *Bicycles, etc.*—The Japanese use bicycles to a limited extent only. A few men in each regiment having bicycles of their own are encouraged to use them in time of peace, and I understand are paid something for their use in time of war. They have no bicycle corps of any kind. Neither have they used automobiles or captive balloons. This refers to the army I have been serving with only.

7. *Artillery.*—The system of fire of the Russian artillery fails to get out of their gun what there is in it. It outclasses the Japanese gun in range and rapidity of fire, and yet the Japanese gun lives through the fights. The Russian system of fire does not, apparently, contemplate a definite target. All day long they will search the country around within 8,000 yards of their batteries apparently hoping they will hit something. The Japanese, on the contrary, never fire without a definite objective, to which they determine the distance accurately and spend a good deal of time in getting their fuse and range exact. They always verify with high-explosive shells, which they handle with great accuracy. Even when they have located their target the Russians will fire a "sweep"—8 shots with great rapidity, or even more. Then they rest for a minute or two, during which the Japanese cannoneers emerge and continue their slower but more accurately placed fire.

The Russian system of observation, if they have any at all, is remarkably poor. For hours I have seen them bursting shrapnel about 100 yards beyond a Japanese battery at which they were firing without ever discovering their error or shortening their fuse. Their gun can smother the Japanese gun at any stage of the combat and yet they rarely do it. The Russians have no shell with their field artillery—only shrapnel—which gives the Japanese a great advantage in their high-explosive shell, using it against intrenchments.

8. *Cavalry.*—During the advance upon Liaoyang the cavalry of the Second Division, together with three batteries of field artillery, were turned over to the Guards, because they could not be used in the mountains through which the Second Division had to march. After their arrival in front of Liao-

yang, and the cavalry and guns had rejoined, the cavalry was not used in action.

9. *Infantry.*—One of the first results noticeable as the war progresses is the increase in interval between files in the infantry attack. Before I came to Manchuria I saw Japanese infantry at drill at Aoyama Park in Tokyo, showing small intervals in the first stages of the advance and closing in still more in the last rush, the so-called German method of attack. During the advance on Liaoyang, however, their method was not distinguishable from the American method in any marked degree. They took every advantage of cover, with plenty of intervals between files, and used individual fire. It is not at all the headlong rush of masses of men across the open which the paragrapher depicts. On the contrary, the infantry is not sent in at all by day unless the enemy's position has been thoroughly shaken by artillery fire. If this can not be accomplished successfully, the night attack is used. The night attack of the Russians at Motienling on July 17, which I have commented upon in my report number 1, the night attack of the Japanese at Chipanling the morning of August 26; on Manjuyama the night of Sepetmber 1, and the Russian night attacks on the same place the night of September 2-3, described in the body of this report, all lead to the thought that the progress and development in killing capacity of the modern rapid-fire field gun and rifle have forced the attack, if it desires to live at all, to return to the old methods of a century ago when the individual man and his bayonet was the winning factor in the hand-to-hand combats of those days.

REPORT NO. 6.

War Department,
Office of the Chief of Staff,
Washington, January 3, 1905.

My report No. 3, dated October 5, 1904, concluded with the First Japanese Army occupying the territory to the north of Liaoyang and extending to the Yentai coal mines, with headquarters at Fenshan, a village near Liaoyang. About this date the Japanese learned that the Russians were advancing in force to the south and had crossed the Hun River.

They were approaching the Japanese position by the mai Liaoyang-Mukden road, by the road passing east of Mukde by Fushun, and a large force was moving toward the Japanes right flank, which rested at Pensihu. Other columns wer reported upon auxiliary roads passing between the mai roads, of which there are many leading south from Mukden

After the battle of Liaoyang there were frequent attack by the Russians on the Japanese outposts, but they wer all small affairs. This movement, however, was a differen thing, and the Japanese reply to it was to move up their entir army to a line extending from Pensihu through the Yenta coal mines to Yentai station and extending beyond it to the left, thus occupying a front of about 25 miles, which was ver thinly held at many points. As the Russians approached, the Japanese withdrew from their advanced positions to the general line I have indicated, the first army standing with the Twelfth Division on the right, the Second Division on the left of the Twelfth, with a gap between them, the Imperial Guards being in rear of the line occupied by the Second and Twelfth divisions and opposite this gap.

On the left of the first army was the fourth army, under General Nodzu, and on their left the second, under General Oku.

On October 9 the Japanese right at Pensihu was attacked by a vastly superior force of Russians of all arms, which approached Pensihu from three sides. The garrison at Pensihu had been reinforced up to four battalions, and resisted vigorously. The Russians cut the line of communications from Pensihu to Hsihoyen, and the force at Pensihu had to be cared for by passing supplies to them along the front of the army. Along the general front of the first army the Russians were approaching from the north and attempting to envelop the first Japanese line. They were in plain sight from the Japanese line, streaming over the hills in great masses and forming in front of us, preparatory to attacking. Large bodies of Russian cavalry came out into the open, marched, countermarched, and retired over the hills again. The Japanese army was intrenched all along the line, and occupied the trenches during the night of the 9th, awaiting the Russian attack.

On the morning of the 10th the Russian artillery opened the attack on the front of the first army. I accompanied the Second Division during the fighting, which has received the official designation of the battle of the Sha River. The day was devoted to the artillery duel, Japanese patrols advancing to develop the Russian infantry positions and retiring in good order under the Russian fire. When night came the Japanese batteries advanced about 800 yards, where they again went into gun pits.

On the 11th the artillery duel was resumed at 6.30 a. m. on our front. The fighting was general along the whole line, the Russian captive balloon being visible on our left and apparently in front of the second army. During this day's fighting there were 10 Russian batteries opposed to the Second Division. It was stated by General Fujii, chief of staff of the first army, that the right of the Second Division was held back so as not to force the Russians back before the fourth army (on the left of the Second Division) came up.

The severest fighting was at Pensihu, where two of the Japanese positions had been captured by the Russians and then retaken by the Japanese, with great casualties on both sides. The situation at this point was very critical, and the independent cavalry brigade, under Prince Kanin, was swung around to the right on the 10th, coming up on the Russian left flank with 4 machine guns, enfilading the Russian position and really turning the tide of the fighting at that point in favor of the Japanese. The Russian plan of attack apparently contemplated turning the Japanese right and striking for Liaoyang and the line of communication of the Japanese army.

The fighting of the Second Division on this day, the 11th, centered about Temple Hill,[a] a prominent landmark, having a temple upon it called Ei-an-ji, or the Temple of Perpetual Peace. Before daybreak, the Okasaki brigade of the Second Division (Sixteenth and Thirtieth regiments) occupied the line Hanlashantzu-Sorinju, the Sixteenth Regiment at Hanlashantzu and the Thirtieth at Sorinju. The brigade headquarters was behind the hill at Sorinju, with a reserve, consisting of one battalion composed of two companies of each regiment. The Russians occupied a line with their right resting on Temple Hill and the line extending along the hills to the northeast and east, with 8 guns on the hill north of Sanchiatzu and 16 guns north of Sanjotzushan. On the hill northeast of Shaotaku there were 8 or 10 Russian guns. From Sankuaishihshan extending east the Russians had a position, with 8 guns and 5 or 6 companies of infantry. The Japanese guns were posted as follows: Four batteries east of the foot of the rocky hill and one group of 3 batteries east of Kentao.

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[a] Sheet No. 4, map of Manchuria.

General Okasaki's orders were to occupy the line I have described, and to advance in conjunction with the forward movement of the fourth army on his left. The Russians resisted stubbornly, this being the day, of all the fighting which I witnessed in Manchuria, when the superiority of the Russian field guns was most strongly shown. They simply smothered the Japanese guns, keeping the cannoneers in their holes in the ground at practically all stages. At 3 p. m. orders were sent to General Okasaki to take the hill. At 4 p. m., making no impression on the Russians on Temple Hill, Okasaki requested the artillery commander of a group (3 batteries) of mountain guns and a group of field guns south of Sorinju to concentrate their fire on Temple Hill and the Russian artillery near there, to assist him in his attack, which they did for an hour.

The ground over which the attack had to be made had been cleared of kaoliang, and was very open, and the advance had to be made under a flanking fire. The brigade took the extended order at Sorinju, and was ordered to move on Sanchiatzu with as much rapidity as possible and then attack the hill. The brigade was fired on by artillery on both sides, but advanced without faltering, and at 5.10 p m. took the hill. Two battalions of Russian infantry advanced to the assistance of the Russians falling back from Temple Hill, under a heavy artillery fire from the Japanese batteries at Sorinju. As the Japanese took the hill, a Russian regiment appeared in double column east of Sanchiatzu, with their band playing. One and one-half battalions of the Twenty-ninth Infantry advancing toward the town, seeing the Russian regiment, stopped and did not enter it. The Thirtieth Regiment was north and west of Temple Hill and the

Sixteenth northeast of the hill and toward the village to the east.

The advance of the Russian regiment covered the withdrawal of their artillery at the foot of Sanjotzushan and the hill north of Sanchiatzu.

The Russians made a counter attack between 8 and 9 p. m., but were repelled.

About 7 p. m. one and one-half battalions of the Twenty-ninth Infantry, entered Sanchiatzu, and were immediately engaged by one Russian regiment of infantry, attacking on three sides.

Three companies of the Sixteenth Regiment were sent to the assistance of the battalion and a half of the Twenty-ninth, and, after desperate fighting, drove the Russians back. The fourth army came up on the left, between 11 and 12 that night.

At 3.30 a. m. of the 12th General Okasaki moved to attack the next ridge, the Twenty-ninth Regiment being on his right and the Thirtieth on the left, the Sixteenth in the center, the general himself with the Sixteenth, and having a reserve of two companies of the Thirtieth. Patrols were sent out, and found no Russians on the right ridge, but the highest hill, called Rokoshan, was strongly held.

The Sixteenth was thrown forward, and rushed the hill on the left (Nanshan), taking it without firing a shot, the hill being held by a line of outposts with the main Russian force at that point behind the hill. A patrol of two sections was sent forward from the reserve (the Thirtieth Regiment) working toward Rokoshan. Moving by the right, this patrol, climbing up the hill, discerned a company of troops coming up in the darkness, and could not tell whether they were Japanese or Russians. Lieutenant Tamura, in command of the patrol, called out "We are here," and received a volley immediately, at a distance of 30 paces. A fight ensued, and the Russian force was driven back. At that time a strong Russian force was in front of the Twenty-ninth Regiment, so that it could not advance. One company of the reserve was sent to the assistance of the two sections previously sent up, and this force was attacked by six companies of Russians. One battalion of the Twenty-ninth Infantry was sent to flank the Russians, and in cooperation with the company and two sections drove the Russians back. The division formed line with the Twenty-ninth on right, Sixteenth on the left, and the Thirtieth in the center. The second group of artillery came up and took position in the village at the base of the hill. This was the position at dawn.

At 8 a. m. the Russian artillery opened fire—when it became light enough to see what they were doing. Ten guns east of Shaotaku, twenty-four northwest of Hamatan. Near Sankuaishishan there were also eight guns, which at intervals fired at the Second Division, although fronting the fourth army.

The Japanese artillery fired at Shiroyama and also at the Russian artillery in the valley.

The Russian artillery fire was very severe, but the Japanese infantry held, although unable to advance during the whole day.

On the night of the 12th-13th there was a thunderstorm, and the Japanese tried to take advantage of it to take the hill, but it was not possible. The ascent was steep and the front so narrow that not enough troops could be brought to the firing line at one time. That night the Tenth Division of the fourth army arrived at Nanshan, releasing the troops of the Second Division holding that point. They also attempted to take Shiroyama by night attack, without success.

The Russian artillery at Hamatan was the great obstacle to the Japanese taking the hill by day, so during the night of the 12th-13th the Japanese artillery changed position to a point where they could fire at Rokoshan and Shiroyama and also at the Russian artillery at Hamatan.

In the morning of the 13th the artillery duel began.

The Russian infantry position extended to the left along the crest of the hills, and Yangchengchai was also occupied. The key to the whole position was the crest of Rokoshan and Shiroyama, which was strongly entrenched.

The right wing was reinforced by two battalions of the Twenty-ninth Gobi (reserve) one battery of artillery was ordered to fire at the hill and two batteries to engage the Russian artillery. About 4 p. m. the 13th a brigade of Russians reinforced the top of the hill. The Third Battalion, Sixteenth Regiment (Japanese) reinforced the First and Second battalions of that regiment, already engaged.

The entire attacking force was then the Sixteenth Regiment, the Thirtieth Regiment, one and one-half battalions of the Twenty-ninth, and two battalions of the Twenty-ninth Gobi.

The hill was taken at 5 p. m., after the most spectacular exhibition of infantry work I witnessed during the entire campaign. The hill was steep, and the infantry advancing by rushes, recoiling under the deadly fire poured upon them, reforming and going at it again, finally sweeping over the crest, with flash of bayonets as they got contact with the Russians on the top. These Russians simply stayed to the end. An examination of the dead showed the following Russian divisions: Ninth, Twenty-second, Thirty-first, Thirty seventh, Fifty-seventh. There were 81 men dead on the crest of the hill, with a very large percentage of noncommissioned officers among them.

The brigade advanced and took the next ridge of hills at 8 p. m., the Sixteenth Regiment on the left, then the Thirtieth, Twenty-ninth, Twenty-ninth Gobi.

During the night 13th-14th the Russians tried counter attacks, but were driven back.

At 7.10 a. m. on the 14th the line reached the hill north of [a]Miaokou. By the afternoon the fourth army on our left had moved up in prolongation of the line of the Second Division, and the Imperial Guards had advanced to connect with the right of the Second Division. Upon occupying the hill north of Miaokou there was visible in front about one brigade of Russian infantry, one brigade of artillery, and some cavalry. The Second Artillery opened upon these troops and drove them back. The line pushed forward to Tainhsiangtun, where it is to-day. During the battle of the Sha River the Matsunaga brigade was detached for service farther to the right of the line, and the first army reserve given to the Second Division in place of it.

The casualties of the division during the fighting were given as 1,835, not counting the casualties of the Matsunaga brigade, which properly belonged to the division.

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[a] Sheet No. 5, Map No. 2.

The battle of the Sha River was upon a much larger scale than that of Liaoyang as to numbers engaged on both sides, and also as to casualties. It was of greater importance from every standpoint. For the first time during the war Russia acknowledged a superiority in numbers. The manifesto issued by General Kuropatkin to his troops before sending them in clearly states this. The tremendous losses he sustained, placed, according to their own account, at 50,000, or one-fifth of his entire force, would seem sufficient to have produced demoralization in any army. This was not the case with the Russians. The more they were hammered the better they fought.

On the 15th of October we (some of the foreign attachés) stood in the front Japanese line looking at Mukden, which lay right in front of us and not 20 miles away. The Japanese had driven back the Russians in six days continuous fighting, with frightful casualties. It seemed inevitable that we would walk into Mukden. On the night of the 16th–17th the Russians, who had stopped at the Sha River, turned upon the Japanese center (the fourth army), decimated General Yamada's brigade, and captured 14 of his guns. They delivered a series of counter attacks all along the line and stopped the victorious Japanese army in its tracks. It has not moved since. The Russian line of resistance at this time, as far as can be gathered, was not the Sha River, but the Hun River, where they had constructed defensive works.

The effect of this battle was clearly shown upon all the Japanese generals with whom I came in contact. They seemed to realize for the first time, or at least showed openly for the first time, that they realized the magnitude of the conflict upon which they had entered. The Japanese loss, as given out officially, was about 15,000.

The loss of 50,000 by the Russians placed the superiority in numbers in the hands of the Japanese, and it did not seem as if they could be stopped. However, the unexpected happened, and I left the Japanese praying that the Russians would attack them in their intrenched positions.

GENERAL COMMENT.

1. *Winter clothing.*—As soon as there was a halt in the advance the Japanese put their army in winter clothes. They issued heavy, long, khaki overcoats with fur-lined collars, to the men. A great many of these were made out of ordinary blankets, the stripes on the original blanket still showing. A general call for blankets for war purposes was issued in Japan, and the papers stated that Tokio alone contributed 200,000. Some of these were made into overcoats, and the entire winter outfit of the army was issued at very slight cost to the Government itself. The overcoat of the Japanese up to this time was black, and impossible for field service. The advantage which their army had over the Russians in the summer by being in khaki had been on object lesson to them, and when winter came they discarded their black overcoats without discussion.

2. *Machine guns.*—After the battle of the Sha River machine guns were used with the first army for the first time, as far as my observation goes. These guns came in toward the last of October, and detachments were being drilled in their use and practiced in the firings. I was not allowed to handle this piece, but examined it from a short distance. It is of the general Hotchkiss type, having a heavy looking tripod with a seat on the rear leg for the gunner and a shoulder piece. In front of the trunnions there is a radiator of spiral form. It fires the Japanese small-arm cartridge. This gun was said to be made in Japan, but an officer of high rank stated that they had constructed it after the model of a Hotchkiss rapid-fire gun captured by them at Tientsin in the Boxer war. These guns were put in at advantageous points in the line of defense and were expected to give good results. The use of the machine guns at Pensihu during the fighting I have related in the body of this report. These guns were carried on wheel transportation and when used were dismounted and set up on tripods.

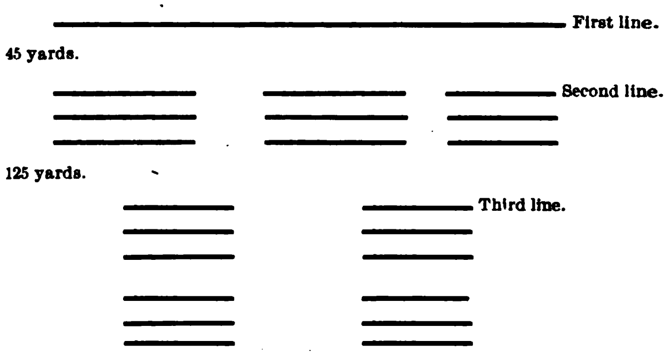
3. *Night attacks.*—In the battle of the Sha River the use of night attacks by both sides, to which I have referred in previous reports, was again very noticeable.

The attack made on the night of the 11th–12th by the right division of the fourth army, which touched the left of the

Second Division of the first army, presented some interesting features tactically. The method pursued was as follows:

There was no moonlight, and all the details were explained to commanding officers of regiments and battalions before sunset by the division commander.

The attacking line was in three echelons. The first and second lines were each divided between two commanding officers. The third line was under the division commander. The reserve of the fourth army supported the attack from the left and rear. The first line took close formation in one line, the second line moved in company columns, the third line in closer formation thus:



To make sure of communication between the lines, soldiers were put between the commands with white flags. The whole division marched with bayonets fixed. The first line was ordered not to fire except in case of urgent necessity, the second and third lines not to fire at all. Every man (wearing khaki by day) was put in black with a white band on the left arm. Each commanding officer of an organization located by day his objective for the night. Scouts were sent out in front of each company and were ordered to march 50 yards in advance, and if the Russians fired on them not to retire, but to lie down, so as not to stop the fire in rear.

The watch of the division commander was made the standard. A cluster of kaoliang on the hill occupied by the division commander was burned at 1 a. m., giving the correct time to the whole division. The command was fed at 11 p. m., so as not to make the fight on empty stomachs.

Neither the Russian nor the Japanese army make surprise a feature of night attacks. Generally, before the attack, the position they desire to take is overwhelmed with artillery fire for an hour or so before darkness sets in and even after dark. Then the infantry makes its advance. The Russians have, in several cases, made night attacks with drums beating or singing their war songs during the advance. The subject of night attacks leads naturally to some discussion upon the use of the bayonet and sword in modern fighting.

4. *Use of bayonet and sword.*—The Japanese bayonet is a knife bayonet with the edge ground sharp; a line of infantry stacks shows the marks of the grindstone on all the bayonets. The bayonet is carried in a scabbard on the waist belt and only fixed at command, to make stacks, or to use in a fight.

The Russian bayonet has exactly the same method of attachment as the old-fashioned Springfield rifle bayonet and has a similar cross section, except that it has four sides. It terminates in a blunt end like the end of a screw-driver and is always carried fixed to the gun.

The Japanese bayonet is by construction better fitted for use than the Russian, and in practice this has been the case.

I talked, through an interpreter, to one of the Japanese soldiers in the field hospital of the Second Division, First Japanese Army, who was wounded by bayonet in the battle of the Sha River, and he said that he and the other Japanese soldiers thought the Russian bayonet "no good; they couldn't drive it in easily."

The Japanese sword is a short two-handed weapon, with a very sharp-edged blade of perfect steel, slightly curved and constructed for cutting, not piercing. The modern officer's sword has a guard. The old Japanese swords had no guard for the hands.

They cover the scabbard, in the field, with a leather case, so that the glitter of scabbards will not be noticeable.

The Russian officers' swords that I have seen (captured) were also shorter than the American, with a single-handed gripe and much the same kind of a guard as the Japanese.

Swordmanship is the natural inheritance of the Japanese upper class; the Samurai and all officers are taught the use of their weapon, which is for fighting and not for theatricals.

One of the most striking lessons of the Japanese war is the return to the use of the bayonet and sword upon the battlefield. This is greatly increased by the constant use of night attacks by both sides. While the statistics of the number of killed and wounded by bayonet and sword on the Japanese side do not show a large number of casualties due to these weapons, it can be safely stated that the number on the Russian side is much greater, as the Japanese have been successful so far in most of these attacks.

In the first battle of Motienling, on July 4, 1904, when the Japanese outposts were attacked by the Russians in the darkness, just before dawn, 15 Japanese were killed, all with the bayonet, out of 36 men on the outpost.

In the fighting from August 25 to August 31, advancing on Liaoyang, the Japanese reported 45 wounded by the bayonet in the first army. In the fighting thereafter, while no figures were given, I have seen numbers of Russian dead and some Japanese wounded from the bayonet. While exact figures will never be available as to the number of casualties due to the bayonet on both sides, it is a noticeable fact that the bayonet is not an obsolete weapon by any means in modern warfare, in spite of the increased effectiveness of the modern rapid-fire field gun and magazine rifle.

This is also true of the sword. In the same fights to which I referred above, Japanese officers gave a good account of themselves with the sword, and in one of the day's fighting of the battle of Sha River Major-General Watanabe, of the Imperial Guards, getting involved in a night attack, took care of himself and accounted for his opponent with his sword, in spite of his years and rank.

These being facts, it would seem to be the part of wisdom to consider whether the rod bayonet (used also as a cleaning rod), which is part of the new Springfield rifle, will be as well suited for hand-to-hand work as a bayonet more on the lines of the Japanese bayonet, leaving the cleaning-rod feature out of the question, and also, if we are to have a sword at all, whether the weapon we now have is one which would be effective in actual fighting.

5. *The wounded.*—On the 22d of October, after the fighting had finished, I visited the field hospital of the Second Division. It contained 750 wounded and 30 sick Japanese and 32 wounded Russians. Ten of the Japanese wounded were by bayonet. The division had four field hospitals with a capacity of 200 each. Slightly more than one-half of all the wounds were due to shrapnel fire, the Russian artillery having been

very effective against the division on Temple Hill, as I have described.

The field hospitals were in the Chinese villages, the houses being fairly well cleaned up and operations being performed in tents placed in the compounds around the houses. The patients were quiet and cheerful and anxious to get back to the firing line. There were very few prisoners taken in this fight on our front, and they were all wounded.

6. *Field artillery.*—I have commented in former reports upon the inferiority of the Japanese gun to the Russian. I understand that Japan is conducting negotiations for a new field gun.

They have organized a number of batteries with captured Russian field guns and are doing everything they can to overcome their inferiority in this respect. A gun firing a light projectile will always be silenced by one firing a heavier projectile, and nothing has been shown in this war more plainly than the necessity of having the heaviest projectile with the horse and field guns consistent with the work these two arms are called upon to perform.

7. *Military attachés and newspaper correspondents.*—One of the most striking things in connection with this war has been the way in which Japan has handled the question of the censorship. There can be no doubt that the standard set in this war has furnished an object lesson which will be represented to all the great powers by their attachés in the field in such a way as to make some similar method a necessity in all future wars. Although the Japanese have not completely solved the problem, it can not be doubted that their censorship has been of distinct advantage to them. The estimates of the strength of General Kuroki's army which were published in Russian papers on the authority of the Russian general staff were always largely in excess of the actual number, and this misinformation undoubtedly influenced their strategy to a marked degree. When I joined the army at Fenghuangcheng, Kuroki had three divisions, with perhaps 60,000 men, including noncombatants. Russia gave out his strength at 100,000. When he attacked Liaoyang he had, including men on the line of communication, coolies, and noncombatants, 100,000 men, and the European papers gave him anything from 150,000 to 300,000. When the Japanese troops went into a fight all

numerical designations were taken off their shoulders, so that Russia could not get, from the killed or captured men, information concerning the organizations opposed to them.

On November 2 the attachés with the first army were put into winter quarters at the Yentai coal mines, occupying the house of the manager of the mines, a British subject, which gave us the best accommodations we had during the year.

On November 20 I received a cable from The Military Secretary, in consequence of which I left the coal mines at 7.45 p. m. for Dalny, en route to the United States. I found the railroad in good running order over the whole distance. The Russians had done little damage to the road. The bridges, except the one at Liaoyang, had the trusses thrown off the piers into the water, and the Japanese had erected trestle bridges alongside, generally of less height than the embankment, so that the trains ran down an incline on one side and up on the other.

The outer rail had been moved in, so as to give the narrow-gauge width necessary to use Japanese engines and cars. No Russian transportation was used.

I arrived in Dalny at 1 a. m. on November 22. This town had practically no damage done to it by the Russians before evacuating.

The heavy granite pier, permitting any seagoing vessel to run alongside, and having railroad tracks running out upon it, was intact. The dock had its gates taken off, towed out to sea, and sunk. The Japanese after searching the harbor for them without success offered $100 reward for information of their whereabouts and Chinamen took them to the spot where the gates were sunk in less than half an hour.

I left Dalny at 12 o'clock on the *Akimaru,* their largest transport, 6,444 tons gross, taken from the Nippon Yusen Kaisha Line; arrived at Shimonoseki November 24, and left at once by train for Tokyo, where I arrived November 26.

I left Tokyo November 30 and Yokohama the same day, sailing for the United States on the *Mongolia,* of the Pacific Mail Line.

Report of Capt. John F. Morrison, Twentieth Infantry (now Major Thirteenth Infantry), Observer with the Japanese Army.

NOTE.—Captain Morrison arrived in Tokyo March 23, 1904, and was assigned by the Japanese war office to the Second Japanese Army, commanded by General Oku. He left Tokyo for the theater of operations on July 20 and joined the headquarters of the second army at Haicheng on August 8, 1904. He remained with the second army until October 30, 1904, when he left for Dalny en route to the United States. On arriving at Dalny he proceeded to the headquarters of the Third Japanese Army in front of Port Arthur, where he remained from November 1 to November 5, finally sailing from Dalny for Tokyo and the United States on November 8, 1904.

The Second Japanese Army, to which I was attached, was commanded by General Baron Oku. It consisted of the Third, Fourth, and Sixth divisions, a brigade of field artillery of two regiments, a brigade of cavalry, and a body of "auxiliary troops." The number of these auxiliary troops and their organization was kept a secret. They were reserve troops, and were put in action, I know. They were sometimes spoken of as the "general reserve." In the divisions were troops of this class, but whether as an extra brigade or as extra battalions in the regiments is unknown.

ORGANIZATION.

The division is an administrative as well as tactical unit, and is supplied with the full administrative staff, trains, etc. The division commander has the rank of lieutenant-general.

The division consists of 2 infantry brigades, 1 field artillery regiment, 1 bridge column, 1 train battalion, 1 cavalry regiment, 1 engineer battalion, 1 ammunition battalion, 1 bearer corps, 6 field hospitals, and the reserves or auxiliary troops mentioned above and whose organization and strength I do not know.

ORGANIZATION OF THE INFANTRY.

The company of infantry consists of 220 men and 4 officer and is divided into 3 *zugs* or platoons.

Four companies constitute a battalion, commanded by major, whose staff consists of one adjutant, one paymaster and two medical officers. The battalion is both a tactical an administrative unit. It has its own train and draws its supplies direct from the division.

Three battalions constitute the regiment, which is commanded by a colonel. The regimental staff consists of one adjutant and one color bearer. The infantry regiment is purely a tactical unit.

The infantry brigade, composed of two regiments, is a purely tactical unit commanded by a major-general, whose staff is composed of two adjutants or aides and one veterinarian.

The field artillery regiment consists of 2 battalions of 3 batteries each. Each battery has 6 guns.

INFANTRY SOLDIER.

The infantry soldier impresses one very favorably. While small, he is sturdy, strong, active, and intelligent. The minimum height is just above 5 feet; the average, I was told, was 5 feet 2 inches. The companies and regiments are remarkably uniform in size. The chest measure varies between 34 and 36 inches. The men have legs strongly muscled, good shoulders, and are generally splendidly set up. They appeared very cheerful and contented, even happy, but remarkably undemonstrative. Even in the attack, where I was near enough to hear, there was no cheering. They seemed to take their work seriously and yet with quiet enthusiasm. No soldier could fail to be impressed by the quiet, methodical, businesslike way in which officers and men did their work.

One attack that I saw at close range could scarcely have been distinguished from a drill in the park at Tokyo. The discipline at all times was nearly perfect. I never saw a case of disorder or drunkenness while with the army, and comparatively few cases where men showed any signs of having been drinking intoxicants; yet beer and spirits were obtainable at most places along the line, and saki was issued to the men at times. I was told that cases of disobedience of orders or serious neglect of duty were extremely rare.

There was great regard for the property of the inhabitants and little damage done. This was equally true of the retreating Russians. Behind the Japanese army there was little to indicate that two armies had passed over the country.

Severe as was the fighting, there was no apparent bitterness against the Russians. I several times saw wounded Russians brought in and the Japanese soldiers invariably treated them with great kindness. I talked with Japanese officers and men, and they always spoke in praise of the Russian soldiers' bravery

MARCHING.

The Japanese infantry, on ordinary route, marches slower than our men. I doubt if its rate of march exceeds 2 miles an hour, and at times is even slower, To be sure, the roads were bad, but the marching, even allowing for bad roads, was slow. The soldier always seemed to me to be too heavily loaded. Twice I saw troops marching to gain a position from which to attack, and then the step was much faster.

I saw very little straggling. The columns opened out considerably on the road, as was to be expected over such ground, but the men very generally kept in the column. There was a great deal of fatiguing running by men in rear to close up. The head of the battalion kept its pace and on crossing small streams, and particularly bad places in the road, the rear had to catch up. Loaded as they were it must have been extremely fatiguing. There was considerable distance between the battalions on the march.

As to the conduct of a march there was little to learn from them. While I was with the army there were no long marches; all advances were but for comparatively short distances at a time. I believe they are capable of making long, hard marches if called upon to do so.

Very great attention is paid to athletics in the army. I have seen a battalion with pack go more than a thousand yards at a run over a stubble field. The prescribed step is, quick time, length 29½ inches, 114 to the minute; double time, 33½ inches, 170 to the minute.

CLOTHING.

During the summer the men were dressed in khaki blouse and trousers, with a khaki cover on the cap, strong, well-made shoes with hobnails, and light-weight canvas leggings.

The blouse is fastened with nine hooks and eyes and has two inside breast pockets. Inside the left front flap of the blouse is a special pocket in which is carried the first-aid package. The leggings are fastened with buttons. Attached to the cap by the side buttons is a curtain of light weight khaki-colored cloth to screen the back of the head and neck from the sun. All wear flannel abdominal bandages.

The overcoat is made of heavy dark-blue cloth, with hood. It is unlined, double-breasted, fastened with large bone buttons.

A metal tag, on which is engraved name, rank, company, regiment, and number, is worn on a cord over one shoulder and under the other arm so that the tag is on the breast; it is worn under the clothing.

All numbers and marks indicating company, regiment, or division were removed from the uniform.

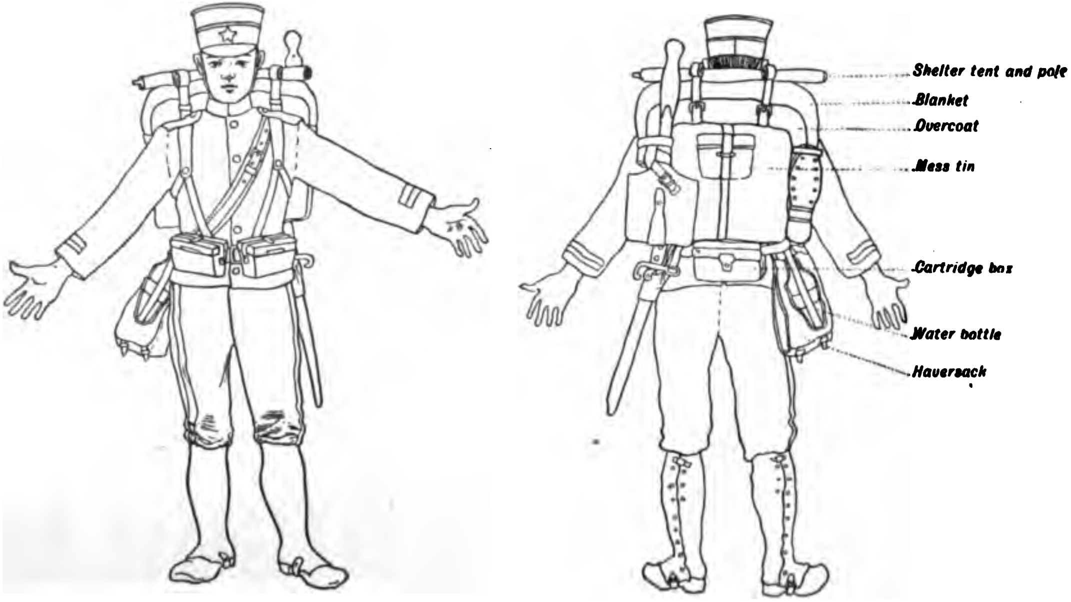
CLOTHING FOR COLD WEATHER.

As the weather became colder the army put on the blue uniform and over it wore khaki. The cap was the same as before, and the troops began to carry the blanket, which they had not generally done during the summer. In the latter part of October the troops were equipped with the winter outfit. They had a sleeveless khaki-colored jacket, reaching to the legs, and lined with goatskin. It was worn under the blue overcoat. Over the blue overcoat they had a long, loose, unlined, olive-drab coat with a deep collar of goat or sheepskin.

Up to the time I left no special issue of head or foot covering had been made, and I saw no heavy gloves or mittens.

INFANTRY SOLDIERS' KIT.

Rifle.—Weight, with bayonet, 9 pounds 8½ ounces; weight, without bayonet, 8 pounds 9½ ounces; total length, with bayonet, 5 feet 5½ inches; total length, without bayonet, 4 feet 2½ inches; length of barrel, $31\frac{1}{16}$ inches; caliber, .256



JAPANESE INFANTRY PACK.

inch (6.5 mm.); number of grooves, 6; depth of grooves, 0.006 inch; twist, one in 30.7 calibers; breach action, safety bolt; magazine, five rounds, loading with clip.

Cartridge.—Weight, 348.5 grains; powder, nitrocelulose, 32 grains; weight of bullet, 162.9 grains; initial velocity, 2,300 f. s.; sighted from 400 to 2,000 meters.

Bayonet.—Straight blade, 15½ inches long and seven-eighths of an inch wide, pointed, and sharp on one edge.

A leather waist belt, 1¾ inches wide, is worn; it is fastened in front with a galvanized iron buckle. To this belt is suspended, by a loop, the bayonet scabbard, and, by two leather loops each, three cartridge boxes. Two cartridge boxes are worn in front and hold 30 cartridges each. The third, which is larger, holds 60 rounds and is worn behind. On one end of the larger box is a loop in which is carried a screw-driver, and in a pocket on the other end is carried a small oil bottle.

Knapsack.—It is made of cowhide, with the hair outside, stretched on a framework of light wood. Inside dimensions are, 11¾ inches wide, 10¾ inches from top to bottom, and 4¼ inches deep. In the knapsack is carried three days' rations—two of biscuit and canned meat, and one of specially prepared rice—one suit of cotton underwear, two pairs of cotton socks, and 30 rounds of ammunition. An extra pair of shoes is carried fastened to the knapsack, one shoe on each side when no intrenching tool is carried, both on the right side when a tool is carried.

The knapsack is worn on the shoulders; straps fastened to top corners go over the shoulder and are fastened by buckles to corresponding bottom corners. A stay strap is riveted to each shoulder strap. On the end of this strap is a brass hook which is passed between the body and waist belt, and belt rested in hook. Much of the weight of the belt is thus taken up by the shoulders.

The overcoat, when not worn, is rolled and attached to the knapsack by straps. It reaches around three sides, as shown in sketch.

The blanket is red wool of fair quality, 7 feet by 5 feet 4 inches. When the blanket is carried it is rolled and carried in the same way as the overcoat.

The shelter tent is of water-proofed cotton, khaki colored, 5 feet by 5 feet 2 inches. By means of grommet holes and strings attached to tent many pieces can be joined and a good-sized tent built. It is carried around the poles on top of knapsack, as shown in sketch.

Shelter tent poles.—These are jointed, each man carrying two joints rolled in tent. These joints are very strong, of hard wood, 17½ inches long by five-eighths of an inch in diameter. A metal head 1 inch long fits in a socket and locks similarly to the bayonet on the rifle, except that stub is on inside of socket.

The haversack is a small canvas bag, made of light-weight duck, 8 by 10 inches, worn suspended by canvas strap over left shoulder on right side. It is divided into two compartments and is strengthened on seams by leather. This is for the soldier's convenience. In it he carries small articles and in battle he is sometimes required to carry extra cartridges.

The water bottle, of uncovered lacquered metal, capacity about 1 pint, is worn suspended by leather strap over right shoulder.

Mess tin.—This is of lacquered aluminum, shape of field-glass case. It is 5½ inches deep, 6 inches across the bottom, and can be used for cooking rice. When the rice is cooked in bulk it serves as mess tin. A small tray in the top holds the fish, shoyo, etc. It is carried fastened to back of knapsack and has a capacity of one-half a day's ration.

INTRENCHING TOOLS.

Besides the tools carried in the battalion train, to be mentioned later, each company is provided with the following tools carried by the men: 68 spades, 8 axes, 16 pickaxes, 4 saws; total, 96 tools.

These tools are carried in turn by the men. They are fastened to the knapsack on the left side. Each is provided with a leather case that covers the blade. The spade is strong and stiff; blade, 5¾ inches wide by 7½ inches long; handle, 1 foot long. The newer ones have the blade rolled on top to afford a better bearing surface for the foot when necessary to push it in the earth in this manner. The others are straight.

The ax.—The handle is about 18 inches long, the blade 4¼ inches wide at edge and 6½ inches long, and head 1⅜ inches thick.

Pickax.—This is of the mattock pattern; blade, 15 inches long; handle from end to blade, 15½ inches.

Crosscut saw.—This is made in 12 sections, each 3⅞ inches long and between one-half and three-fourths of an inch wide. Sections are connected by two short pieces of steel riveted on so as to allow of saw being folded. The saw is carried in a leather case, 6½ by 6 inches, in which is also carried the two handles, a file for sharpening the saw, and spare rivets and connecting pieces. I saw considerable work done with these tools and all seemed thoroughly serviceable. The saw was much more effective than I expected it would be.

The load carried by the men, exclusive of winter clothes, but including spade, is about 60 pounds. The weight given in their table is 56 pounds 13 ounces, but does not include 30 rounds of ammunition and two of the three days' rations. The knapsack was generally worn, although the foot artillery that I saw carried none, but used a blanket roll. In advancing to the attack the knapsack was often taken off. How generally this was done I could not find out.

I saw the infantry of a division one evening moving out preparatory to a night attack. They did not have the knapsack. In other cases I know of regiments leaving them off. The troops in the division referred to had a blue cotton bag or sack, worn over the shoulder like a blanket roll, in which was carried the food and extra cartridges.

The infantry company officers carried a sword, revolver, and field glass and were provided with a very neat knapsack. This knapsack was made of fair leather, slightly smaller than the men's, and worn in the same way.

FOOD AND COOKING.

Besides the food carried by the men, the battalion train carries one day's food, the division train four. The cooked ration, emergency, carried in the knapsack, consists of one ration of prepared rice. This is spoken of sometimes as the "iron ration." It consists of rice that has been cooked and dried. The ration is put up in three sacks, one for each meal.

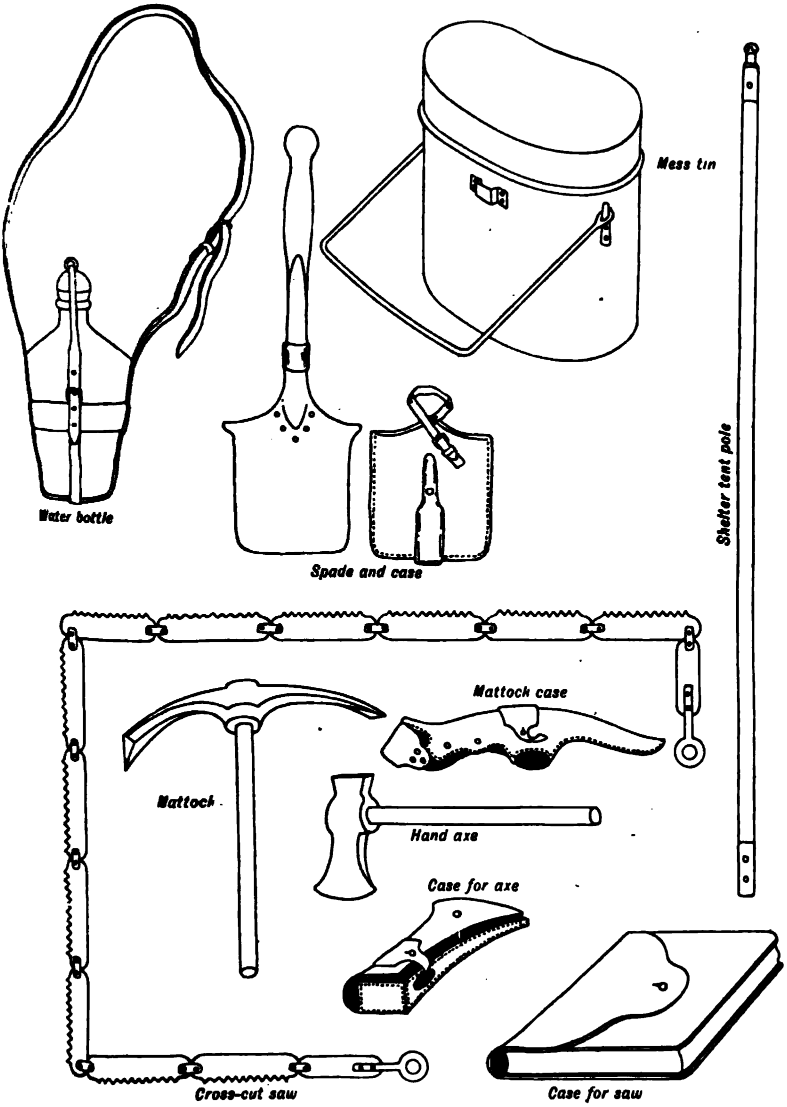
To prepare it the sack is immersed in hot water for a very short time when the rice swells, nearly filling the sack. If immersed in cold water the same result can be obtained, but it requires more time, and the result is a cold meal. It can also be eaten dry, but, to my taste at least, is not very palatable. When soaked as above, the resulting food is practically boiled rice. It apparently keeps well.

Two rations of biscuit and meat.—The biscuit comes done up in packages wrapped in tough white paper. Each package is the allowance for one meal. A small can of beef, weighing about 4 ounces, is issued for each day. The beef is sometimes packed in double-ration cans. The biscuit is excellent, crisp, and very palatable. The meat to the taste of most foreigners was not palatable, but the Japanese soldiers liked it. It was flavored in some way; I believe soy is added in canning. All these articles are prepared in Government establishments. The biscuit and meat ration was sometimes issued at other times than during a battle, although the issue was rare.

The ordinary ration issued consists of twenty-four twenty-fifths of 1 quart of rice; one-half pound of fresh meat or fish or its equivalent in canned meat or fish or dried fish; one-half pound of fresh vegetables when obtainable in vicinity, otherwise some substitute therefor; a small cake of salt; an occasional issue of saki, whenever ordered by commander, about one-half pint per man at an issue.

The general commanding, when he deems it necessary, may order special issues, or the money value of the ration may be given when market is advantageous. More fish is issued in summer than in winter. Until after September 6 very little fresh meat was issued. It was generally either the canned meat spoken of above or, much more frequently, fish. The fish issued was generally either canned salmon or other fresh fish or a dried fish that looked like the dried herrings seen in our market, except that they were a little larger.

Fresh vegetables during the same period were seldom issued. In place thereof canned shoyo, dried seaweed, and dried lotus root were substituted. The shoyo issued was principally the large radish grown in Japan known as "daikon," to which was added in small quantities other vegetables, such as cucumbers, celery, etc. The vegetables were cut up, cooked, soy added, and then canned. It is not very palatable to most foreigners.



JAPANESE MESS KIT AND INTRENCHING TOOLS.

In one company of the Third Division the bill of fare for two months previous to September 6, except for cooked rations during active operations, was as follows: Saki was issued four times in all; fresh vegetables twice in all; seaweed once a week; lotus root occasionally; canned shoyo daily at the rate of one can, about 2 pounds, to nine men; canned meat or some form of fish daily; rice daily, generally served as follows:

For breakfast, boiled rice and one can of shoyo for nine men; for dinner, boiled rice and one-half can of meat; for supper, boiled rice and either canned or dried fish. On many days fish was furnished at two meals and no meat issued.

On September 23 another company was investigated, and I found they had had, since September 6, fresh meat three or four times a week and fresh vegetables as often, the meat being usually served in the form of soup.

The above bills of fare were obtained from sergeants in each case and were confirmed by my own observations of the men at their meals. On the above date I saw a large herd of cattle which a staff officer told me the supply department had purchased for issue to the troops. Later I saw other herds and found fresh beef was being issued to the troops in part for the fish and tinned meats.

Saki was issued more frequently as the weather grew colder. Whether on account of the cold, or because the railroad having been put in operation it could be brought up easier, I could not tell.

In quantity the ration was ample. It was one easily transported and convenient to handle.

The canned salmon issued was the usual commercial article, part of it of the "Alaskan brand."

COOKING ARRANGEMENTS.

The individual mess tin carried by the soldier is used when the heavy baggage is not up or men are detached. A mark on the inside of the can shows how much rice to put in; another mark indicates the proper amount of water to add for one meal of rice.

Each battalion is provided with a number of field kitchens. They consist of a fire box made of five pieces of light steel.

Each section is $1\frac{4}{5}$ feet high and $1\frac{7}{30}$ feet wide. They are fastened together by lugs and form a cylinder $2\frac{1}{10}$ feet in diameter. A stoke hole is cut in the bottom of one section, and a round hole, about 4 inches in diameter, for escape of smoke, near the top of the two back sections. A light iron pot, nearly hemispherical and fitting into the top of this fire box, is provided with lugs to keep it in place. A thin perforated vessel fits into this, leaving a space of about 3 inches at bottom and flush at the top. It is similar in principle to porridge or rice cookers in common use. The capacity is 20 full rations of rice or one meal for 60 men. To make soup or boil water, the perforated boiler is removed. Cornstalks or straw seemed to be satisfactory fuel.

These kitchens are carried on the battalion pack ponies; two complete kitchens on a pony. The sections of the fire box are nested and packed as center pack. One double pot in a strong rope net is hung on each side. The weight of each complete is about 75 pounds. A few large galvanized iron water cans and wooden spatulas seemed to complete their outfit, except for the chop sticks carried by the men.

QUARTERING AND TENTAGE.

No tentage was issued to the troops except the shelter tents. I never saw these put up in pairs as we use them, but they were put together in varying numbers, from 4 to even 18, and in varying shapes, affording fair shelter for an equal number of men. But even this was seldom done. The main dependence was on the Chinese villages and railroad buildings.

The army, except the advance troops, and often these, were quartered in the buildings of the country. The Chinese villages were filthy in their surroundings, and the houses swarmed with vermin. By this means of sheltering the army much saving was made in baggage, but the troops were badly quartered with unsanitary surroundings. When I left, the first line of troops on the Sha River were quartered in bombproofs in the line, the reserves and supports in villages in rear.

With the investing army at Port Arthur I saw preparations for winter quarters. These consisted of holes dug 4 meters square and 22 inches deep. The earth excavated was thrown up to a height of 28 inches and revetted, generally with stone, making a wall 50 inches high. These were to be covered with nine pieces of shelter tent as a roof. The work was very neatly done, streets straight and parallel. They were unoccupied when I was there. The troops not in the trenches when I was with the investing army, November 1 to 6, were occupying Chinese villages.

RECRUITMENT

The replacing of the losses in the organizations at the front was very effective. But a few days after a fight the companies were again at their maximum strength. Ten days after the battle of Liaoyang I saw a regiment that had suffered heavily there, marching by, and counted the files in the companies and found them full again. I counted many companies in the same way. While I did not know the organization, the companies were uniformly of full strength and that shortly after the fight.

DETAILS FOR SPECIAL DUTY.

One marked feature of the Japanese system is their avoidance of details from the fighting units. They have special troops of various kinds for the duties usually performed in our service by details from the line. Large numbers of untrained men were called in for what they call "transport troops." These are placed under "train troops" and perform all the transport work not done by hired coolies.

In rear of the army, every few miles along the entire length of the line of communication, were "Étappen stations." Each had its garrison, composed of "Étappen troops." These were special troops, generally men who had had military training but not wanted in the line. The commanding officers of the most important stations were detailed from the infantry; all the other officers were reservists—generally retired officers called back to the colors.[a] The troops guard the line, supplies, etc.

At each of these stations is an "Étappen hospital." The force for these hospitals is drawn from the "Red Cross Society," not from the regular medical department.

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[a] Their system of graduated retirement provides a number of officers of this class.

A supply department officer is at all the important stations in charge of matters pertaining to his department. In riding slowly over the line of supply from near Dalny to Haiching, I never saw a soldier belonging to the fighting force at the front, except sick and wounded going back and new troops going forward to replace losses. And it was the same while with the army. Their trained fighting men are not used for other purposes. These "Étappen stations" follow the advancing army closely.

CANTEENS.

The Japanese army had, for the convenience of the soldiers, what they called canteens, but they much more resembled our old sutlers. Men received permits to follow a regiment and sell to soldiers such supplies as tobacco, cigarettes, beer, towels, soap, sweets, etc. Each sutler or canteen-man could have his stores brought over on the transports free, but must provide his own land transport, other than railroad. These stores were required to be sold to the men at an advance not exceeding 15 per cent over cost.

MEANS OF TRANSPORTATION.

These consisted of the railroad and cars, pack poines, the one-horse Japanese military carts, hand carts, native carts, and bearers. The railroad has been a great factor in the supply of the second army and is now the main line of the three armies in the north.

The railroad, from Dalny as far north as I went, was a good piece of work. It was solidly constructed and well ballasted. Bridges and culverts were all of stone or stone and steel, except three bridges which seemed to be in process of construction, temporary wooden structures being used. There was no appearance of a serious effort having been made by the Russians to destroy or injure the railroad.

The Japanese army captured several cars at and near Dalny, but no serviceable locomotives. When I went up the line the latter part of July, what cars they had were being used to transport supplies, using coolies for power—twelve to eighteen men to a car. Draft animals could not well be used owing to the many open bridges and culverts, and the fact that most of the cars were without hand brakes and could not be controlled on the grades.

At this time the Japanese began narrowing the gauge of the road to that of the Japanese roads by moving one rail in. This was done by degrees and rolling stock was brought from Japan. Supplies were then hauled part way by locomotives and pushed by hand the remainder. By October 3 sufficient rolling stock was available and the track narrowed to Liaoyang, both from Yinkou and Dalny and trains were running regularly.

By October 25 trains were running to Yentai. Without this railroad the supply of this army would have been very difficult with the means at hand, and the advance slower. The Russians lost a good opportunity to delay the Japanese advance by not seriously injuring this road.

The horses used by the Japanese army were principally Japanese ponies. Those used by the cavalry were the best and were much better cared for and handled than the others. I saw the cavalry mounts on the picket line a few times. They seemed to be in good condition and almost entirely free from sore backs and galls. With the transport animals it was different. A very large number were badly galled by the harness. The draft ponies were about thirteen hands, thin chested, and weedy in appearance, and in poor condition during the summer. Much of the condition was due to the harness and poor handling.

The grain ration, chiefly barley, was about 8 pounds per day and was ample for a pony of their size. But very little long forage was fed, some days none at all.

The eagerness of the animals to get even poor straw showed their need of some coarse fodder. During the summer open sores on the animals were miserably cared for. The flies were very thick and were not excluded. Many sores if they had been carefully washed with a weak solution of carbolic acid, or even clean water, and then smeared with pine tar, or some similar treatment given, as we have all seen done in our corrals, would have healed in a few days, but they were neglected or badly treated and became most disgusting in appearance and often resulted in permanent disability.

The pack animals seemed to suffer much less from sore backs than the cart animals. Later in the season there was a decided improvement in the condition of the transport animals, both in flesh and freedom from sores. This was due to more long fodder being fed and improvement in harnessing, as noted further on.

Most of these animals were stallions and vicious. As they were constantly fighting if near each other, it made them difficult to transport and picket, and they wasted too much of their energy fighting and resisting. This fact has been recognized by the military authorities, and colts destined for the military service are now gelded. This regulation has not been in effect long enough yet to bring the geldings into service. A few geldings were seen and they were much better than the stallions.

A few Chinese ponies and mules were noticed in the trains toward the last of my stay. These are much better animals than the Japanese.

PACK SADDLE.

This consists of two curved pieces of wood 2½ inches by 1 inch, on each side of which is an iron strap three-sixteenths of an inch by 1 inch. These are connected by one-half inch boards, one on each side next the horse, and by a wooden rod near the bottom on the outside and extending beyond the curved pieces, so as to form projections for the lashings. Heavy pads covered with leather and canvas are fastened to this frame. A woolen blanket is used under the saddle. On the framework or tree are hooks and rings by which certain of the loads are hooked on and need no other lashing.

A man leads each pony. The maximum load is 198 pounds; the usual load much less. To fasten a load to one of these saddles is very simple and requires little practice provided the load is, as in this army, of uniform sized packages of fixed and light weights.

THE JAPANESE MILITARY CART.

This is a two-wheeled cart, shafts rigidly attached to body. It has no sides or end boards. It is provided with a single seat for the driver, but this is seldom used as the man generally leads his pony.

Dimensions of cart: Diameter of wheels, 37½ inches; width of body, 25 inches; length of body, 72 inches; track, 46 inches;

width of tire, 1¼ inches, nearly; hub similar to that on our escort wagon; weight, about 270 pounds; load supposed to be 356 pounds, but in Manchuria was much less, being under 200 pounds.

HARNESS.

The harness in pattern is very much like our light harness with breast collar. The back pad or saddle is like those in common use in the United States for single harness, except larger. The cart and harness are well adapted for a smooth drill ground and do well in Japan, where the roads are narrow and smooth, although extravagant of men. In Manchuria it was a failure. The cart being rigid and the saddle of the harness firmly attached to shafts, as one wheel at a time takes a chuck hole, this saddle acts like a saw and soon cuts the pony's back in a serious manner. I saw hundreds of ponies with very bad backs from this cause. Later this was partially avoided by placing large pads made by folding a blanket under each side, or more generally by rolling a blanket and placing one end of roll under each side of saddle, bend to the front.

Some Chinese cart saddles were later used. These were the same in principle as those issued by our Quartermaster's Department. The roads were rough and badly cut up with ruts and chuck holes, particularly bad for the Japanese carts. The wheels were too small for the deep places in the road. I saw carts stalled with a load of about 163 pounds in places where a good six-mule team would have gone through with a load of 2,500 or 3,000 pounds. A two-wheeled cart, a little smaller than that drawn by the pony, drawn by men was used. The regulation cart was sometimes used in the same way.

A large number of these handcarts were in use between the landing place at Liushutun and Kinchou in July, and during the advance on Liaoyang I saw about 200 of these carts loaded with field mortars and ammunition for them hauled by foot artillerymen. These handcarts were occasionally seen at other places, but not in large numbers.

This army had no wheeled ambulances. The wounded either walked, rode in the springless carts, or were carried on litters. Generally, if at all able, they walked; otherwise they were carried. A large number of Chinese seemed to be employed for this work. Aside from the railroad their best means of transportation was the native cart. These were heavy and clumsy in appearance, but very strong, with two wheels fixed to a revolving axle. Width of body inside, 31 inches; length of body, 104 inches; diameter of wheel, 48 inches; track, 48 inches. The average load put on was about 975 pounds, though at times it was much less. On good roads the same trains and carts would handle a ton.

The team was hitched with one animal in the shafts, the others abreast in front. The teams consisted of three, four, or five animals, but generally of four. One that I saw consisted of a cow, a mule, a pony, and a donkey. South of Kaiping the teams were seldom all of the same class. From Kaiping the teams were chiefly of three good ponies or mules, frequently having a donkey in addition. They were driven without reins, were in fine condition, clean and fat, free from bruises or sores. They seemed very gentle and tractable, and showed every sign of good handling. Thousands of these native carts were in use.

Few Japanese carts and practically no pack ponies were used on the line of communication, the main dependence, aside from the railroad, being on native carts. The native carts were also used in large numbers to help out the division trains.

The division supply trains and ammunition columns consisted of hundreds of Japanese carts, while the bridge column had a one-horse, four-wheeled little wagon that carried a half pontoon or a corresponding amount of timber.

THE INFANTRY BATTALION TRAIN.

This consists of sixty pack ponies and a saddle horse. The train is divided into two sections, designated as light baggage and heavy baggage. The two sections combined follow immediately in rear of the battalion on the march. On going into action the first section follows as far as possible with reasonable safety. The second section is left far enough back to be out of all danger from fire.

The first section, or light baggage, consists of 1 led saddle horse for the major, 1 pony with medical supplies, 18 ponies with ammunition, 2 ponies with tools, 1 pony reserve; total, 23. Second section, heavy baggage, 9 ponies with luggage, 10 ponies with cooking utensils, 16 ponies with provisions, 1 pony with horseshoes, 2 ponies reserve; total, 38; grand total, 61.

There are several features about this battalion train that impressed me favorably. Their transportation was always with them, was well organized and simple, could go over nearly any country the battalion could, and possessed some good special features as to packing.

The medical supplies are carried in four small chests, uniform in size and weight, that can be put on or taken off the saddle in a few seconds. Generally speaking, only the medical supplies needed for first aid and emergency work are carried.

Each pony carrying ammunition is provided with two chests, with hinged lids and hasps, each holding 1,440 rounds. Near the hinges are fastened two short pieces of chain, by which the chests are simply hung on the saddle by placing links over hooks on the saddle. A lash rope can be passed around the chest from one end of the lash rod to the other, but this was not generally done. Ammunition can be removed from the chest without removing it from the saddle, and loading and unloading the pony is the work of a few seconds. These ponies proceed to the ammunition column for new loads whenever the chests are emptied.

Each pony carrying tools has 20 long-handled shovels and 10 pickaxes. These tools are carried in a collar or loop of half-inch iron, about 4 inches across and 2 feet long. This loop is provided with short chains and is hooked on to the saddle, as the ammunition chests are. Five shovels, nested, are put in on each end of the collar, handles crossing below, the picks in the center, all blades up; a turn is then taken around the handles where they cross with a rope. A single tool can be removed and put back without taking off the load; but, as with the ammunition, taking off and putting on the load is a simple matter.

The nine ponies with luggage have all the personal baggage of the 21 officers of the battalions, the office outfits, blanks, etc., of the companies and battalion. Each officer below the rank of major is allowed one small trunk of prescribed shape that, packed, weighs less than 35 pounds. This is his allowance of baggage. Other officers, according to rank, have more. These little trunks are easily put on the saddle, usually four to a pony.

Ten ponies carry the cooking utensils, already described. The 16 ponies, loaded with provisions, carry one day's food for the battalion, and each day reload from the division trains. Spare horseshoes for all the ponies in the train are carried on one pony.

There is one transport soldier for each pony, and these men do all the work involved in bringing up the rations, loading and unloading the baggage, etc. The regimental headquarters is allowed two ponies for baggage. On the march they are usually attached to one of the battalion trains.

While it was evident to me that the Japanese pack saddle for rough, heavy work, with packages of all sizes, shapes, and weights, is not the equal of the aparejo, for the battalion or company train it is superior. Particularly for ammunition and tools does it answer to modern conditions. Both must be available and it is not always desirable or even practicable to take the time to unpack and repack the aparejo to get part of the load. The long training and skill necessary to properly pack an aparejo is not necessary. Any man who can put on an ordinary saddle and lead a mule can serve as transport soldier with this train.

In the Japanese army all "transport troops" in war are men untrained as soldiers. They are not even "train troops." An excellent regulation of the train service requires all packages to be of dimensions and weights best adapted for loading on their carts and ponies.

LINE OF SUPPLY OF THE SECOND ARMY.

The second army, under the command of General Oku, landed near Pitsewo, May 5, without resistance. His force at this time consisted of the First, Third, and Fourth divisions.

A detachment seized Pulantien May 26, cutting the telegraph line and breaking the railroad, thus separating the troops at Port Arthur and vicinity from the remainder of the Russian army.

On the 20th of May the Fifth Division was landed and the Eleventh Division began to land on the 24th of May. Supplies were landed and a base established. The main body commenced the movement south May 22, leaving the Fifth Division, which was soon reenforced by the Eleventh Division, to guard the base and protect the rear of the army from attack from the north.

On the 25th of May was fought the battle of Nanshan, which resulted in the Russians withdrawing toward Port Arthur, leaving Dalny, Liushutun, and Talienwan Bay to the Japanese. General Oku commenced his return march to Pulantien and Pitsewo next day, and in a few days had withdrawn all his force except the First Division, which was left as the investing force.

The Eleventh Division proceeded south and joined the First Division, and about July 15 the Ninth Division landed at Dalny and also joined the investing army.

Talienwan Bay was cleared of mines and Dalny became the base of the investing army, and Liushutun on the north side of the bay became a base for General Oku's army. General Oku's army now consisted of the Third, Fourth, and Fifth divisions.

June 13 the Sixth Division commenced to land at Pitsewo and was added to this army. General Oku on June 13 commenced his march north, the Fourth Division on the Fuchou road, the others on the main road.

On June 15 the battle of Telissu was fought and the Russians again driven back. The second army, after this brilliant victory, remained at Telissu until June 20, when it advanced to the plain of Hsiungyocheng, about 25 miles to the north. Here the army remained until July 6 when it again moved north and, on July 9, captured Kaiping. It remained here until July 22.

July 24 Tashihchiao was captured and the Russians abandoned Yinkou. Haicheng, owing to the movement of the fourth army, was abandoned by the Russians, and on August 3 was occupied by the Japanese. Liaoyang was occupied September 4.

THE LINE OF SUPPLY.

Pitsewo was the base at first and supplies for the army landed there were conveyed to the army over the roads Pitsewo-Kinchow and Pitsewo-Pulantien-Kinchow. After Talienwan Bay was cleared of mines Liushutun became the base, although Pitsewo was also used. In addition to the wagon road the railroad was also used, supplies being forwarded by man-propelled cars.

As the army moved north, supplies came as far as Pulantien from both Pitsewo and Liushutun. From there north they were carried in native carts on the two wagon roads and by cars over the railroad. At Hsiungyocheng the road was only about 6 miles from the coast and supplies were now landed here to lighten the pressure on the other lines. Supplies were loaded at Talienwan Bay on Korean and Chinese boats and taken around the end of the peninsula to Hsiungyocheng, but owing to the danger of the first part of this route it was more usual to haul the supplies across to Kinchow Bay and load there on the junks. After Yinkou was occupied supplies were also landed at this place and were brought across to Tashihchiao.

The narrowing of the railroad was begun the latter part of July, locomotives were used on it part way from early in August, and by October 3 the road was in full operation from Dalny to Liaoyang, and Dalny was the base for the army. On October 3 trains were also running to Yinkou. On October 31 long trains of native carts could still be seen along the road as far south as Tashihchiao, and may have been used still farther south, but I did not see them.

METHOD OF TRANSPORT.

Every 12 to 18 miles along the roads used as lines of supply "étappen" stations were established, as already described. The officials at each station received the stores from the preceding and forwarded them to the next. The carts hauled from one station to the next, where they unloaded and went back, other carts taking the loads on to the next. Each "étappen" was responsible for the transport to the next station beyond. The cars on the railroad were pushed from station to station in the same way, each station furnishing the coolies to send the cars to the next.

When I passed over the line in July and August there were employed on each "étappen" from 400 to 600 native carts and a large force of Chinese coolies to push cars and do other labor. Pulantien, Hsiungyocheng, and Tashihchiao were busy and important stations on the line.

ROADS.

These were dirt, generally bad, but still not impassable; much better than the roads in the Philippines. The soil most of the way was a clayey loam, only a small part being sandy. There were no heavy grades. The roads were intersected by many small ditches or waterways. During the summer, owing to the amount of rain, the roads were soft much of the time, and the native carts, from their construction, cut them up badly. They seemed in most parts to dry quickly. A little work on the worst places would have improved them very much and would have more than repaid the labor in heavier loads and quicker time. But apparently almost nothing was done. About 100 yards from one of the "étappen" stations on the line was a mudhole in which I saw one morning three carts upset and many stall, delaying the train altogether for a considerable time. Any practical man with a dozen coolies and a couple of carts could have made this particular place a good road in two or three hours with the material at hand. Nothing was done and the same state of affairs was observed at other stations and all along the route.

After the advance north from Pulantien until Hsiungyocheng was reached shortage of supplies was not infrequent. From here on this difficulty was not so great.

The native carts move slowly, occupying much space on the road for the load carried. Hence the capacity of the single road is light, particularly when the carts are being continually stalled.

Scarcely any supplies were obtainable in the country passed over, not even grain for the animals. The Chinese, however, provided forage for their own animals.

The problem of supply was a serious one until about August 1, and must have hampered the army considerably. Sick and wounded going to the rear rode in the empty carts if they could stand it, otherwise they were carried on litters. Later the cars were used, the patients sitting or lying on mats on the floor of freight cars, most of which were flats. They had no wheeled ambulances.

The "étappen" hospitals at most stations were practically rest houses for the sick and wounded, where they rested over night or longer if not in condition to go on next day. Some of these hospitals were large and at times had many patients The Japanese always cleared their main army of disabled men, sending them to the rear promptly, some going directly back to the base, others by stages as they could stand the transportation.

The Japanese displayed great energy in this work, organized the transport well, and kept supplies moving. They were handicapped by the poor quality of the native carts, the worthlessness of their own in this country, and the bad condition of the roads.

We have much to learn as to regulation and organization of transportation, but nothing as to means, unless in part from their pack saddle. I have seen nothing anywhere equal to our six-mule team and army wagon for wheeled transport for an army, particularly where roads are bad, and the aparejo, for general use, leaves little to be desired.

THE AMMUNITION SUPPLY.

The infantry soldier carries in his three pouches on his belt 120 rounds and in his pack 30 more, making 150 in all.

In the battalion train each of 18 ponies carries 2,880 rounds, or 51,840 in all. Allowing the battalion its full strength of 880 men, this gives about 59 rounds per man.

The number carried in the division trains is 100 rounds per man.

Ammunition depots were established near the front from place to place as the army advanced. At these depots the division train refilled its carts.

Before entering on a serious attack each infantry soldier was given 50, and sometimes more, cartridges, making 200 or more in all carried by the men. I was unable to find any case in which additional ammunition had been supplied to the firing line after the attack was well on. It may have been done, for there were many regiments engaged and I could find out positively in only a few.

At the battle of Telissu the troops on a part of the line exhausted their ammunition, but at this time they were reenforced from the general reserve and, as I was informed, shared the cartridges of the fresh troops. In the attack made from the right of the Japanese Second Army on the hill position before Liaoyang, on the early morning of August

31, the troops gained a position at the foot of the hill, but were here checked. They held on here and maintained the fight at short range until 1 p. m., when another effort was successful and they gained the trenches on the top, but only at one end, and had to hold on until dark. These men started in with 200 rounds and fought it out until dark without a fresh supply.

A regiment, in the attack on the inner line at Liaoyang, that was in action September 2 and 3, and very heavily, expended the following amount of ammunition:

	Rounds.
First battalion	109,964
Second battalion	52,000
Third battalion	79,746

In the attack on Shihliho, in the advance on the Sha River, the men on the firing line expended only a few shots over 100 rounds per man.

With well-disciplined troops who have been well instructed in rifle practice, 200 rounds of ammunition would appear to be sufficient to carry through an attack. In the fighting, while I was present with the army, taking ammunition to the firing line actually engaged in most cases would have been practically impossible, and was rarely, if ever, done. In most cases, the more likelihood there is of needing more ammunition the more difficult it will be to get it up to the line. Nevertheless, the data in my possession are too meager to form a basis for conclusive deductions on this important subject.

INTRENCHMENTS.

The Russian positions I saw up to and including Liaoyang were deliberately prepared with great care. Those at Nanshan were fair samples of their work. Their infantry trenches were nearly always the common standing trench, made by digging and throwing the dirt excavated to the front as a parapet. I measured some of them, the average dimensions being—depth of trench 3 feet; height of bank, 1 foot 6 inches; making 4 feet 6 inches protection. This was far from being universal, however. In many cases the trench was not so deep, the parapet being higher. The parapets were generally revetted, either with sods, stones, or sand bags, depending on locality and material at hand.

At Haicheng, in addition to the infantry trenches, they had forts constructed as salients in the line, with deep ditches and heavy parapets. These were for use of infantry.

The Russian trenches on the Shoushanpu position were almost entirely simple standing trenches, as above described. In their rear, usually on the reverse slope, shelter was provided for men not in the trenches. These were generally covered so as to be splinter proof.

The inner line around Liaoyang consisted of eleven redoubts prepared for infantry and machine guns. These were all very similar in plan and construction. Between these redoubts were the usual trenches and minor works. Covered ways were constructed leading into the redoubts and trenches both at Nanshan and at Liaoyang. Around Liaoyang hasty intrenchments were frequently used by the Japanese.

Troops pushed forward against the Russian works, when checked, threw up hasty cover, sometimes kneeling or lying, but more generally mere head cover. This consisted simply in digging and throwing the dirt to the front, height and thickness depending on the circumstances of the case.

At this place I saw cover constructed for the reserve. It consisted of parallel mounds of earth thrown up about 20 paces apart and about 3 feet high, including the trench, behind which the troops could sit. I was told it was effective cover for shrapnel fire. They were out of range of infantry fire.

After Liaoyang the Japanese army moved north of the Taitzu River and intrenched. Puddled clay was the principal revetment. The works were very neatly constructed, but never used.

In the advance on the Sha River hasty trenches were in constant use. They presented no new features.

One trench, constructed by the Russians and captured by the Japanese, was converted to their own use by the latter by digging a trench on the reverse side.

On the Sha River, October 28, the two armies were confronting each other at short range, both strongly intrenched. I was allowed to visit only part of the line of the Sixth Division. The line seemed to be a development, a growth from an ordinary trench. By digging and throwing the earth to the front the parapet had become strong enough to resist artillery fire, bomb proofs were constructed, and, while no uniform plan seemed to be followed, the works were very strong.

A zigzag covered way led back to the supports and reserves, at this point about 400 yards, and 1 mile, respectively. The covered way was constructed by digging a trench about 5 feet wide and deep enough so that the earth excavated and thrown up on both sides would afford about 7 feet of cover. The supports and reserves were in villages, which afforded protection from shrapnel fire. Nothing new was offered in construction. Our manuals contain practically all I saw in that.

Great reliance was placed on field intrenchments, and their use was very general. Once in the presence of an enemy the intrenching tool seemed next in importance to the rifle and ammunition. The rule on both sides seemed to be to always cover their positions with intrenchments as soon as taken up, even when held only for a short time.

The tools used by the Japanese were strong and serviceable. The work that could be and was done with the small tools carried by the men was a surprise to me. While it was harder work for the men than with longer handled tools, the amount that could be accomplished in a given time when working not under fire was a fair percentage of what could be done with the long handled tools.

Some of the Japanese officers advocate the lengthening of the handles of the tools carried on the men. I believe this of doubtful advantage. The weight carried is already near the limit, if not already there. This increase in length means increased weight all around, for if it is to be used as an ordinary spade it must be stronger, which means heavier. It would be better to carry more regular tools on the battalion pack train. For working where men must keep close to the ground the short handle is better. In other cases it is better to have the large tools from the train.

As far as I could observe or find out by questioning, the hasty cover, either kneeling or standing, was safe cover from shrapnel while the men remained close behind it. Loopholing or giving head cover was not as universally used as I had expected it would be where the works were deliberately prepared.

The Russians had prepared on part of their line at Nanshan the regular sand-bag loopholes, and on other sections a crenelated top, and on a part nothing to afford head cover while firing. At the Telissu position I saw a part of the line provided with loopholes made of sods. The same held in all the Russian works I saw.

The Japanese line north of the Taitzu River, as far as I saw, had a crenelated crest, except one short section, which was loopholed.

The earlier works of the Russians did not appear to be well concealed, but later, as at Haicheng and Liaoyang, much more care seems to have been given to this point.

MILITARY OBSTACLES.

These were extensively used by the Russians and were effective in that their removal cost many lives and added greatly to the difficulty in carrying the positions. The Japanese custom was to detail engineer troops to precede the infantry line to cut the wires and remove obstacles. On a portion of the line August 31 three detachments of 22 engineers each were sent forward to open a way for the infantry assault. Of these 66 men 45 were killed or wounded.

A difficult piece of work of this kind fell to the lot of two companies of engineers who were assigned to open a way to the Shoushanpu position near the railroad. These companies lost over one-half of their strength in their effort.

At Port Arthur I saw a shield that had been made for use of wire cutters. It consisted of a steel plate three-eighths of an inch thick, 18 inches wide, and 3 feet long, with a hole cut near the top to see through. The plate was held free from the body by a webbing belt fastened to raised pieces on opposite sides in such a position as to bring the belt across the chest. The whole was suspended from the shoulders by belts. A man with this on in a kneeling position would be practically covered. I never saw this shield or heard of it with the army in the north.

High wire entanglements and deep pits were the most extensively used obstacles. The former was the usual form of high wire entanglement, the stakes being 3 or 4 feet high. Comparatively little barbed wire was used. It was chiefly heavy No. 8 wire, such as is used on their telegraph lines.

The deep pits were in three rows in quincunx order. They were about 6 feet in diameter and the same in depth, conical in shape, generally with sharpened stake at bottom. These pits were sometimes added to by stringing low wire entanglements over them.

The forts at Liaoyang were provided with wooden chevaux de frise for use at the gorge. A little abatis was also used here, but not extensively, as trees were scarce. More abatis was used by the Japanese north of the Taitzu River, but even here not very extensively. The abatis was constructed in the usual form—the butts buried, limbs sharpened, and the whole connected by wire.

The mines were the stone fougasse, fired by electricity. Their moral effect or the dread of them was out of all proportion to any damage they ever did.

EFFECT OF ARTILLERY.

The Japanese gun is not a quick firer, being one which does not recoil on the carriage. The Russian gun, which is heavier and better in every way, is a long recoil gun. A large amount of ammunition was fired by these guns, but it is exceedingly doubtful if the effect was commensurate with the cost.

We were given the following figures by a general staff officer at General Oku's headquarters of the losses in the fighting from August 26 to September 4, inclusive:

	Per cent.
Japanese casualties from infantry fire	91.35
Japanese casualties from artillery fire	7.99
Japanese casualties from bayonet, saber, etc.	.66
Total	100.00

As the artillery was practically in action for the whole time and for a large part of the time the Russian infantry was not, the effect does not appear to be great enough to stop an infantry attack or greatly check it. Comparatively little cover seemed enough to protect from shrapnel fire. I saw deployed lines under artillery fire three times when I was close enough to distinctly witness its effect. In neither case were the casualties significant.

One case was a battalion running in open column of files from one village to another, obliquely to the Russian batteries' line of fire. The distance passed over was about 1,000 yards; reported to be two batteries firing. Four men in the battalion fell. Others may have been wounded, but if so they continued to march. The result of firing into an advancing line of infantry in attack was but very little better as I saw it. As to its preparing the way for an infantry attack on intrenched positions held by good troops, I believe its effect will be small, except that it may beat down the opposing artillery.

On the evening of August 30 a concentrated rapid fire of nearly 200 guns was poured into the Russian infantry position on the Shoushanpu for one hour, and this followed nearly an all-day's slower bombardment. The following desperate assault by the Japanese infantry was repulsed. I was told the Russian infantry, under the cover of their works during this artillery fire, suffered practically no loss and were ready for the infantry attack when it came.

There were cases that came to my knowledge where the artillery fire was most effective. On the morning of September 1, when the Japanese gained the crest of the hills before Liaoyang and forced the Russian rear guard to retire down the reverse slope, the latter must have lost very heavily from the Japanese fire, but that just as soon as the retiring Russians cleared the crest the Russian guns opened on the crest with shrapnel. The fire was very accurate, and the Japanese immediately abandoned the crest, allowing the defeated Russians to retire in safety.

Shrapnel fire made many places absolutely impassable, as, for instance, the little valley at east end of Scrub Hill.

It was reported by the Japanese as very effective in holding back the pursuit at Telissu, where two Russian batteries sacrificed themselves to save their army from heavy loss. The same was true at many other places. The Japanese found it effective in pursuit in more than one instance. The moral effect on good troops is, I believe, overestimated. From what I saw and was told by Japanese officers of the effect of the Russian artillery, I do not believe that the improvements in field artillery will have much, if any, effect on changing present infantry tactics, but its importance in many cases of pursuit of a defeated army, and to the defeated in covering the retreat, appears to me to be of greater importance than ever. Troops can not come within range unless deployed.

OUTPOSTS.

Very little opportunity was given me to study their outposts. Twice I was allowed to get to the front and study their dispositions. I was permitted, with others, to visit the Fourth Division of this army on October 1. The advanced line consisted of two companies from each of two regiments quartered in villages in the line. The line was well intrenched where the village walls were not in line and prepared for defense. The line was not continuous. The troops of these companies were quartered in the villages and, while not leaving the vicinity, were not "on guard."

The guard was not large. The sentinels were generally on the intrenched line or just in front; in no case more than 50 yards to the front. Cossack posts seemed to be exclusively used, four or five men for each post, one standing watch, the others near by. A few lookouts were established in trees. This guard was changed daily. The companies on the first line were rarely changed, being out two or three weeks at a time.

A little over 2,000 yards back was the main line of defense of the division, and in the villages on this line were quartered six companies of each of the two regiments. This line was strongly intrenched. As this division was the left of the army, its left was turned back and ended in a closed work. A few sentinels were along this line and one in each village. About 4 kilometers to the front the cavalry were quartered and patrolled the country around. We were not allowed to go to the cavalry line.

On October 29 I visited the lines of the Sixth Division. Here conditions were such as to prevent anything like ordinary outposts. The second army held a strongly intrenched line. Nearly parallel to it and at distances varying from 70 to 700 meters the Russians were similarly located. Where I was the lines were about 300 meters apart. A few men were at loopholes watching the Russian line, and whenever a man was seen they fired, and from our experience the Russians were evidently doing just the same. The men in the advance lived in bombproofs under and near the parapet.

I asked the major commanding one of the battalions in first line if he lost many by this "sniping" and was told losses averaged about five per day.

INFANTRY TACTICS IN ATTACK.

The data I was able to collect on this subject were obta in the first case given below from personal observatio short range; the other cases given were obtained from tains or lieutenants who took part in the engagement scribed. Besides what is given here I was able to pic fragments here and there from officers and soldiers.

On October 12 I was fortunate enough to see at close rang attack by a brigade on the village of Shihliho. The villa astride a small stream, which at this point has deep-cut ba The Russian trenches were in front of the village, as show rough sketch. The Russian batteries were on the north of the stream; their number I was unable to ascertain. Russian trenches were the regular simple standing trench, aggregate length of the three being about 800 yards; the rain was a level plain recently cleared of the crops. The road embankment varied from 7 to 10 feet in height.

The distances given were obtained by pacing; the num of shots fired, by counting the empty shells left on the grou All of this I saw, but did not personally do all of the paci I tried on different occasions to follow in the same way t movements of the battalion of the Thirty-fourth Infant but, owing to storms that had intervened and Chinese pickin up the empty shells to sell, failed; but the rushes, halts, et were practically the same as those of the battalion of the Sixt Infantry.

On the morning of October 12 Major Kuhn and I left th headquarters of the second army and proceeded to a hill a little back of the right of the Japanese guns, as shown in sketch reaching it about 11 a. m. An artillery duel was in progress, and continued until about 2.30 p. m. The Japanese guns were not firing rapidly, but quite steadily, at the Russian guns and the village and trenches. A long infantry trench was in front of the batteries and shelter for more troops

behind it. To the left, near the railroad, was cover for more infantry.

The Sixth Infantry was on the right, with one battalion in the first line, the other two behind, part in cover constructed behind the line, the remainder under cover of a village in rear of the guns. The Thirty-fourth Infantry had one battalion under cover, as shown in sketch, and two battalions behind the railroad embankment. I could not see the two battalions of the Thirty-fourth Infantry, but was told by members of the regiment where they were. The strength of the Russians at this point is unknown, but from what I could gather I estimate their strength at about 8,000 infantry and 3 batteries; part of the infantry in trenches, the balance as reserve in the village.

At about 2.30 p. m. the fire of the Japanese batteries became very heavy, principally directed against the village and trenches. Shortly after 3.20 p. m. the two battalions, with all their men in one line at about one pace interval, began the advance, which was carried out as shown in sketch for the battalion of the Sixth Infantry; the other conformed throughout.

From where I was observing the movement the battalion of the Thirty-fourth Infantry in advancing seemed to advance so as to keep the general line, as shown in sketch at start. The two battalions did not move as one, merely striving for the same end at about the same rate. All advances were made at a run. The first three rushes were made by battalion, later by company, and then platoon. The leading company was followed in turn by the others, the rear units only coming abreast of the leading one, never passing it. From the last halt the line had advanced about 80 yards, when the Russians broke, and the advance continued into the village.

The Russians were seen to reenforce their first line immediately after the advance began, apparently with two companies coming from the village. The reserve battalions of the Japanese did not advance.

The artillery support was fine. They continued to fire on the village and trenches until the infantry line was nearly to the objective, then changed to the Russian guns north of the village.

The following brief account of the successful attack by a brigade on an intrenched hill held by the Russians was given me by a captain who commanded one of the comp attack was commenced in the early evening. had to advance for about 2,000 yards across a pl with tall kaoliang. Six companies were sent t village about 1,500 yards from the objective and of the line of advance; they acted as general rese more companies followed the movement as reserve.

The advance began in line of companies in colum At about 1,200 meters from the objective the form changed. Each company had two platoons in the in line of platoons in columns of fours, the third about 150 meters in rear, also in columns of four. 900 meters all deployed at about one man to th intervals between companies being sufficient to a rear platoon to enter the line. Shortly after this firin and the rear platoons came on the line. The adva continued in one line, the reserve companies remainin 1,000 meters back.

By this time it was quite dark, there being only moon. As they approached close to the position, the nese line extended beyond the position and the real attack was made by one battalion. The cohesion of t was kept by the men being required frequently to rai hand and touch the men on their left. The Russian pos of course, afforded a better target in the night tha Japanese line.

A general attack was ordered by General Oku for the m ing of August 31, on the intrenched hills in front of L yang. (See sketch.) The attack was made by the a along the whole line, and failed. Most of the line did cross the obstacles, but they held the position they did re except in one case cited below, until the following night, w the position was carried.

The following brief accounts of the part taken by cert organizations were obtained from officers who were in t fight. The attack on extreme right of the position (end Scrub Hill) was to be from the east and southeast by a bri gade, Fifteenth and Thirty-third regiments of infantry Around the base of this hill were wire entanglements, pits and mines. The next hill to the east was held by the Japa-

nese. The ridge of this latter hill was to be the dividing line between the two attacking regiments.

The Fifteenth Infantry was on the left of the brigade, and the following account of their attack was nearly all obtained from Captain Matsui, who commanded one of the companies in the attack. The first battalion was directed against the east end of the hill; the second battalion was to advance from a village on the plain against the southeast face of Scrub Hill; the third battalion was to be the regimental reserve. The second battalion, for a reason not given, failed to make the advance. The first battalion was short one company, which was back at brigade headquarters. The first battalion formed for the attack with two companies in the first line and the third company as battalion support. The two companies in the first line were in company column (column of platoons closed in mass) with first platoon deployed at one pace interval.

The Thirty-third Infantry had placed two of its companies on the west end of the Japanese hill behind rocks, etc., to cover with its fire, if necessary, the movement. Before the movement began the first battalion was reenforced by a section of engineers to cut the wires, etc. These engineer troops were divided, one-half reporting to each captain. The detachment of engineers sent to each company was divided, one-half going with the deployed platoon, the other with the company column. Captain Matsui was in command of the right company of the first battalion. His deployed line reached the obstacles a few minutes after 4 a. m. It was quite dark, there being only faint moonlight.

The engineers succeeded in cutting the wire and making passages through. His deployed line had passed the entanglement and the other company of the battalion had reached the obstacles in their front before the Russians found them and opened fire. Captain Matsui was now told that the Second Battalion could not move. He decided to go on, and moved forward to a slight depression, where he re-formed his first platoon in line; the supporting platoons had arrived at the entanglements. He now deemed it necessary to wait for the other company of his battalion. He had halted here but for a very short time when the Russians located him and he lost one officer and ten men of his company almost instantly. This decided him to move forward a short distance, which he did.

While getting through the wire he sent a noncommissioned officer forward to see if there were other obstacles in front. Report was brought to him that there was something like mines there. He accordingly sent the engineers forward to cut the electric wire, if mines existed. Owing to the intensity of the fire his company was under, he could not wait for the engineers, but pushed on. The engineers found the mines, but the wire was so deep and the fire so heavy they failed to find and cut the connection. The first company had now come up, but as they had been subjected to a heavier fire than the second company, they had edged away from their direction of advance and, on coming up, overlapped his. The supports of both companies were now in the line. The battalion support had advanced to the end of the Japanese hill, where the conformation of the ground afforded them cover. The regimental reserve also moved nearer.

The line now advanced until it reached the mines, which could be seen, and the officers commenced to divide the companies to pass through between mines, when two exploded, followed very shortly by eight more. No one was injured by this, although the mines were large and loaded with stones, but all were covered with mud. The effect, however, was to throw the line into great confusion; many men were badly scared and started to retreat. The officers now exerted themselves to re-form their lines, and succeeded, but during this operation many officers and men were killed and wounded. Only two officers of the second company remained for duty, Captain Matsui and one lieutenant, and Captain Matsui was shot through the thigh, but kept command.

Day broke now, and he could see the enemy on the hills and batteries to the north, all firing at them. The general attack had failed, the other regiment of his brigade had been checked early, and the other battalion of his own regiment had failed to start. His men were on the slope of Scrub Hill, less than 200 yards from the Russian trench.

Captain Matsui ordered his men to stay where they were and get cover. They took advantage of the large stones on the ground and other natural cover and in some cases dug, throwing up head cover. Here they held on until noon under heavy artillery and infantry fire. Even some Japanese shrapnel broke over them. Their losses from their own shrapnel could not have been heavy, as only six men, all told, were hit by shrapnel.

By noon there had been 300 casualties in this battalion. Their ammunition was getting low and there was no hope of getting more, as the little valley between the two hills was literally swept by fire. Three efforts were made to get a messenger across to the battalion commander; two were killed, the third hit three times. An order was given for every man to keep 50 cartridges to meet a counter attack by the Russians. Twice during the morning every preparation seemed to be made by the Russians to leave their trenches and charge this command, but a heavy fire from the two companies stopped it.

At about noon the Japanese artillery concentrated a heavy fire on the Russian trenches at this point and kept it up for nearly an hour. Captain Matsui now saw the other troops of the brigade advancing, including his own regimental reserve, and ordered an advance. But on trying to rise from the ground he found, on account of his wound, it was impossible, so the charge was led by the lieutenant with him. The line advanced gallantly. This first line reached the trench, was unable to carry it unassisted, but remained on the near side, with only the parapet between the opposing forces. But in a few minutes the reserve battalion and the advance of the other regiment arrived and the Russians were driven out.

Part of the Japanese pursued, but soon came under such a heavy fire that they were driven back to the trench for protection. The Japanese were unable to gain more than the end of this hill, but held this until night, when the whole position was carried. In this attack the troops carried 200 rounds per man; knapsacks were left behind.

From a notebook found on the body of a Russian lieutenant-colonel, killed in the trenches, it was learned that in this particular trench there were three companies of infantry. The latter part of the above attack I saw.

Without following in detail the movements of the other regiment of this brigade, a few points will be given. This regiment received the same order to attack as the other. One battalion was sent to the top of the Japanese hill to cover the attack, two companies to the end nearest the Russians, as described by Captain Matsui; the other two companies of this battalion were back as reserve. One battalion was detailed as the attacking force, with two companies deployed in first line and two as support. The third battalion was the regimental reserve. This regiment commenced to advance at 4 a. m., but was subjected to a heavy fire, particularly from the Russian batteries.

The advance was continued, however, and some infantry and the engineers advanced to cut the wire. These sent back a report that the wire could be cut, but that the ravine in front was impassable. Day was breaking, the regiment was losing heavily, and, believing advance impossible, the first line battalion took shelter in the ravine near by and gave up the advance. The reserves covered themselves where they were. The regiment soon received orders that the attack would be renewed. They had already discovered that the ravine was not impassable, though difficult.

Preparatory to the next advance the reserve battalion was brought forward to the ravine occupied by the leading battalion. The ground between the two lines was open and exposed to a very effective fire. The advance of the reserve was made by one or two men at a time, starting from different parts of the line and running across the open space, about 150 yards, to be followed by others, and so on. Only about one-half of the battalion had come up when the next advance began. At about noon the artillery fire of the Japanese became very heavy and appeared effective and the first line began its advance.

Only one man at a time could get out of the ravine, and in this way they came out, running forward a short distance, where, lying down, they obtained shelter behind a small ridge. After assembling here the first company rushed forward over a line of deep pits to the Russian hill. This company was promptly followed by two others. The losses up to this time had been very heavy. The advance now began up the hill and was pushed home.

Most of the Russians retired, but part took refuge behind rocks and kept up the fire. It was impossible to push the attack further, owing to a heavy flank and cross fire which the

Russians could bring on the ground. For the same reason it was difficult to assemble the command. But the ground was covered with large rocks which afforded good cover, and this was taken advantage of. The troops held on here in this position until dark. The wounded had to be left where they fell until dark.

In this advance up the hill only five men started, but were soon followed by increasing numbers until the whole line was rushing forward.

This advance could be imperfectly seen from where the attachés were held. The advance was an irregular line, as was to be expected up a steep, rocky slope.

The following account of attack of the Thirty-fourth Infantry on Middle Hill was given by Captain Baba, who commanded one of the companies. The regiment was the left of the Third Division, and received the same order to attack as those already described. One battalion was to advance on each side of the road. The Third Battalion, which had only two companies present, the other two having been detached, was to follow the right battalion as reserve.

At about 4 a. m. the advance began. Each battalion sent two companies to the front, deployed at about one pace interval, followed by the other two companies in line of platoons in column of fours at close intervals (company columns moving by the flank), fifty meters between lines. Each company sent an officer's patrol to the front to reconnoiter. When they began this movement there was a faint moonlight, it had just stopped raining, and was very muddy. The kaoliang had been broken and greatly impeded the advance. Every effort had to be made to keep connection in the line.

By 4.50 a. m. the right battalion had reached a point 400 meters from the bottom of the hill, unperceived by the Russians. Here they received a heavy fire. Though suffering heavy loss they advanced the line to the foot of the hill, the supports having deployed came up on the left of their respective companies. The four companies now rushed forward and carried the first line just below the crest, the Russians retiring to the next beyond. The Russians were apparently not very strong. The line, with a very little pause, pushed on and took the work on the crest, driving out the Russians.

The left battalion advanced to their front but litt
the right. The Russians now received a reinforc
two companies from the reverse slope and made a
attack, which was easily repulsed, but the fire from
and left was concentrated on the Japanese and the los
very heavy.

At about 6 a. m. the Russians were heavily reinfor
made several attacks. The Japanese were rapidly di
ing in numbers, but every effort was made to hold on.
regimental commander, both majors, and most of th
pany officers, were killed. The commander of the re
sent one company to reenforce the battalion, but owing
mud and the heavy fire it had only reached the middle
hill when the battalion commenced to fall back.

At 8 a. m. the battalion retired to the foot of the
assisted by the reserve company spoken of above; the o
battalion had already retired. Here they stayed all
holding their position just at foot of hill. The loss of
regiment in this attack was given out as 1,200.

The loss of the right battalion in this attack was: Kill
9 officers, 26 noncommissioned officers, 237 men; wound
7 officers, 27 noncommissioned officers, 277 men; total 5

In the attack of the inner line around Liaoyang, commen
ing September 2, the Japanese made little progress the fir
day. At 5 a. m. on September 3, the Twentieth Brigad
Tenth Division, which was directed against redoubt No.
was in position as shown on the sketch.

The zigzag lines are covered ways. The Roman characters indicate battalions, the Arabic figures, number of company. The successive positions are given for the Second Battalion, Twentieth Infantry only. The Eighth Company at 5 a. m. was in rear, but came on the line at about 11 a. m. With the exception of the two companies shown as in rear, all were in one line shortly after 7 a. m., one-third of the Third Company being in the village. The First Battalion at first was regimental reserve.

The advance, by rushes, at first was made by platoons, then half platoons, then by file, the right element of each company advancing from 30 to 50 meters, the others in turn coming abreast, never passing. The advance by platoon was kept up as long as possible, but as the Russian fire grew more

and more effective the front was reduced. The last advances were made by file—that is, one man at a time rushing forward from 20 to 40 paces until the whole company was on the new line.

Between 1 and 2 p. m. the Twentieth Infantry was reenforced by four companies of the Tenth Infantry and one company of reservists. At 7.30 p. m. the redoubt was stormed and carried by the Second Battalion, Twentieth Infantry, the battalion of the Tenth, and one company of reservists. The attack was directed against the right rear of the work. Between 10 and 11 p. m. the Third Battalion captured a village at the gate of the city.

This redoubt is the only one in the line that was actually carried while occupied by Russian troops.

The Twentieth Infantry lost in this action about 300 killed and 700 wounded. The Seventh Company, which was in the first line from the start and led the assault into the work, lost 98 killed and 62 wounded out of 230 men. The account given above was obtained from an officer of the Twentieth Infantry. The sketch is a copy of a rough sketch drawn by him. The positions given are not meant to show all, simply the advance made in the times shown and of which he was certain.

The tactics of the Japanese infantry in attack offers nothing startlingly new. There is a decided reaction from the great extension advocated by some and used in South Africa. Their first line was usually strong, about 1 pace interval being the most usual, so far as I could find out, occasionally extended to 2 paces. Supports, if used at all, were brought into the line bodily and as soon as their fire could be used. Their only object in having a support seemed to be to simply break the first line while under artillery fire, and as soon as they opened fire the supports were brought in.

Keeping troops close (under 300 yards) behind the line where they can do nothing but serve as a bullet stop was not practiced in General Oku's army. Supports were not fed into the line in driblets. When they put them in it was usual to put them all in at once.

The reserves were held back for long distances, often as great as 1,000 yards. They were brought up close only when cover was at hand. I never saw a case when the reserve was actually put in, but was told the usual method was, when the first line was checked and it was desired to reenforce it, for the first line to hold where it was and for the reserve to deploy and come up in the same way as the first had done.

In their advance by rushes they push forward as large echelons as practicable under the fire they are subjected to. These echelons are reduced as they draw nearer to the enemy. Under very effective fire their advance by file impressed me strongly.

These men are very active and quick, and one man offers so small a target that accurate aim must be taken to have much chance of hitting him; and if the particular man is missed, there is no one on the right or left to be hit. With men as quick as these they offer little time for an opponent to aim, particularly as the other side never knows exactly when or where he will get up. The advance, whatever the size of the element rushing, always begins on one flank of the battalion or company. When the first to rush has halted, the next element comes abreast of it, and so on until the whole line is up. Rear elements coming up do not pass the leading one, merely coming abreast of it.

One paragraph in their drill regulations prohibits fixed rules for fighting formations, yet they give certain normal formations or recommendations, such as—

> "holding one of the platoons of each company, one company of each battalion in hand," * * * "a support about 100 meters in rear of line."

These seem to be little followed in action. In attacks, if the line is checked, their custom seemed to be to hold on, not go back when they can not go ahead.

At Nanshan the left and center succeeded in pushing the line up to about 550 yards of the Russian trench. They could get no farther for many hours, but they held their place. The same was true at Tashihchiao, where, after fighting close in, a daylight assault was deemed impracticable and the troops held where they were until dark.

At Liaoyang, in the attack on the position of Shoushanpu, the infantry commenced the advance on the 30th of August and held to it until the position was carried the morning of September 1. This point is not cited as very new, but as a wise measure that many have appreciated but which is not always carried out.

The Russian work on the Sha River exemplifies the opposite course and shows its cost. Several times they attacked villages or positions, were repulsed and went back, and a new attack was launched. In one place this was reported to have occurred six or seven times. The Russian losses in these attacks were very heavy, and the retreat was generally more costly than the advance.

The Japanese seem to have believed it cheaper to hold on than to go back. A small amount of cover affords protection to a man on the ground, and the Japanese soldier seemed to fully appreciate its value. The value of quick, accurate shooting was most apparent. In the advance by file the target is small and exposed for a short time only. If there are no good, quick shots firing at him he will probably go forward unhurt.

The Japanese scarcely ever used volley fire, while the Russians, on the other hand, were much inclined to its use.

One question was raised in my mind. While not a tactical one it is important. "Are we not reducing calibers too far?" I knew of several Japanese soldiers, and heard of many more, who were hit and continued the fight, and of men wounded who were back to duty in a few days. The bullet has too little stopping power unless it hits an almost vital part.

My observations were of the effect of the Russian bullet, which is nearly a .30 caliber. The Japanese is much smaller. Will not fewer bullets that stop the men hit accomplish more than a greater number that do not put the man hit out of action?

Of the tactics of General Oku one point seems to me to be open to criticism, if a man of my standing may be allowed to criticise so eminent a soldier as General Oku. That is his always assaulting along the entire line. At Nanshan he attacked along the whole line every time, yet the line broken in one place must make the rest comparatively easy.

The losses of the First and Third divisions in their fruitless assaults were very heavy, and they could only break in when the Fourth Division carried the part in its front. At Shoushanpu the whole line was assaulted with heavy loss. It was carried in the center, as already shown, but could not be held because the left was not carried.

A study of the positions will show, I think, that if the Shoushanpu hill was not taken the rest could not be held if taken while the Shoushanpu could be held without the others, and its possession by the Japanese would render the taking of the rest much easier. It certainly would have been cheaper, and just as effective, not to have pushed home the attack at the Shoushanpu anywhere except at the left until the result there was assured.

This campaign has proved that a frontal attack against an intrenched position can be successfully made. But it seems equally proven that the attack must be made by not only brave but thoroughly trained soldiers. I do not believe half-trained soldiers can do it, except at a cost that is practically prohibitive.

The Japanese in their army have shown us little that is not in the books, little that can be truly called original. The organization of the infantry is taken from the German and French; their medical corps is from the German. Their tactics can be found in books open to us all.

The army opposed to theirs was composed of as brave men as themselves, who have had access to the same sources of information and guidance, an army that had better guns for their artillery and better horses for their cavalry, and was commanded by at least as able a general as was in the field. Yet the Japanese have been uniformly successful during the year's campaign, and their success was not due to numbers. The question naturally arises in the mind of every soldier, Why this success?

I can see but one answer—system and training. Everything is systematized, every detail is worked out in time of peace, every man's work is laid out for him. Details even to what an officer can and must carry in the field are prescribed and can not be varied from. And then the system is adhered to.

But all this system could not be carried out without an army that was thoroughly trained and whose officers knew their profession.

The Japanese officers take their profession very seriously. They are educated to the profession and work hard at it.

Their average day's work is long, and holidays are few. The officer who can not keep up to the required standard is shown no mercy. As might be expected with such officers the men are thoroughly trained.

Every officer attends to his own proper work. Generals of divisions are well back and do not attempt to be colonels of the regiments as well as commanders of divisions. The same is true of other grades, and in the Japanese army, at least, the juniors can be trusted to do their work.

What are so often spoken of in our country as "grand-stand plays" and "newspaper heroes" are not produced by their system. An officer must keep to his proper command, and every movement must have a military object, and not merely one to enthuse a non-military public.

War with them approaches an exact science. Brilliant and startling movements producing great victories, such as have occasionally made interesting history, are not produced by this style of war, and equally, I do believe, will it prevent the opponent from succeeding in such movements. It is safe and conservative, but not spectacular.

Report of Lieut. Col. Walter S. Schuyler, General Staff, Observer with the Russian Army.

NOTE.—Lieutenant-Colonel Schuyler left Manila, P. I., for the theater of operations on April 16, 1904, via Peking and Yinkou. On May 16 he reported at Mukden to the viceroy, Admiral Alexiev, and on the following day returned to Liaoyang, where he reported to the commander in chief, General Kuropatkin. During his service as attaché with the Russian army he was assigned to various commands, as follows: June 9 to June 22 to the First Sibérian Corps; June 22 to July 2 to the Second Corps; July 2 to September 7 to the Seventeenth Corps, and during the remainder of his service he was attached directly to General Kuropatkin's headquarters. On December 1 he left the army and returned to the United States via St. Petersburg.

SIR: I have the honor to report as follows upon my observations while with the Russian Army in Manchuria:

ATTACHÉS.

As the various foreign attachés reported at the headquarters of the Manchurian army they were placed under charge of an officer detailed for the purpose of conducting their affairs. He was a young officer of the general staff, a very distinguished graduate of the General Staff Academy, who spoke French perfectly, German somewhat, and English slightly. His duty was to find quarters for the attachés, to superintend the messing arrangements, to advise them upon all matters, to act as censor for their mail, and generally to act as the intermediary between them and the commander in chief. The attachés were supposed to look to him for instructions and to be furnished by him with the necessary credentials to enable them to go about the army.

The only instructions that I received were that it was expected that no official reports, at least no technical reports, should be made until after the close of the war, and that all of our letters should be sent unsealed for the convenience the censor; that no letters should be sent except through hin and therefore that it would not be proper to use the Chines mails without special authority.

A knowledge of either French or Russian is very essenti to an officer on this duty, and not only do many Russian officers speak either French or German, or both (English no being a commonly used nor popular language), but the ordinary conversations among the military attachés are either i French or in German, and it is essential that one should tak part in the current conversation, as otherwise he loses a grea many things to which he would otherwise have his attentio attracted. Of the 24 foreign attachés with whom we wer associated at least 12 spoke Russian fluently and others coul read it well and speak it with difficulty. Most of these gentlemen were selected on account of their knowledge of Russian as well as their general excellence in modern languages. In this respect the continental armies have the advantage of us, in that they have a large number of individuals constantly in touch with the other nations, and consequently always in good practice as to their languages. If I were to suggest the most important consideration for the detail of an officer with the Russian army, I should select a man who could speak French fluently and who has the gift of conversation above all accomplishments. The man who could talk constantly about no matter what and take part in all conversation, whether important or not, was always persona grata.

It is impossible to overestimate the importance of previous preparation in the language, for study of it in campaign takes much time valuable for other purposes. The military attaché must live in the open air with his eyes open and can not afford to shut himself up in a room for the study of anything, even if he has the faculty of concentrating his mind to the extent of profiting by his study in the midst of the innumerable diversions constantly distracting his attention, and, furthermore, be able to understand talk that goes on about him and in which he is not supposed to be a participant, and it is very essential that he should understand the personal narratives of both officers and soldiers, without which it is impossible to comprehend what is going on.

At the end of May each attaché was furnished with a pass, as follows:

> CERTIFICATE No. 4597.
>
> The bearer of this, Colonel Schuyler, of the American service, military agent attached to the Manchurian army, is to be permitted unhindered passage everywhere except in the lines of our fortifications and into important places under guard.
>
> He is authorized to make memoranda and photographic views with the exception of every kind of fortification.
>
> Signed and certified by the Crown Seal this 20th May, 1904, at the town of Liaoyang.
>
> KHARKEVICH,
> *Major-General,*
> *Quartermaster-General, Staff of Manchurian Army.*

When I reported, the attachés were quartered in one of the railway administration buildings, which was cut up into very small rooms. Near this building, on a railway spur, stood a dining car, in which we were furnished our meals as the guests of the Crown.

It is customary in the Russian service for the Government to furnish each mounted officer with a riding animal, and if he need or desire more than that, he supplies the others at his own expense. This rule was followed in relation to the foreign attachés, the Government issuing one animal and issuing forage for the number required, the bills for forage being paid monthly. As the only animals obtainable by the Government at this time were Mongolian ponies, those issued to us as mounts were quite inadequate for that purpose and were ordinarily used for pack purposes. A Russian soldier was detailed as an orderly to each one of the attachés, being supplied only with his personal arms and equipment. He was expected to take care of the animals and to act as driver for the two-wheeled cart, with which each of the senior attachés was furnished by the Government, the officer supplying his own animals to haul it. At first it was announced that one cart would be issued for two attachés, but the Russians were very liberal and in the end almost every officer succeeded in getting his individual cart. As our needs developed it was found that each officer, in order to have sufficient mobility, must have five or six ponies and a mule, a mule and one pony being harnessed to the cart, one or two ponies carrying packs, and the remainder being used as mounts for the officer and his servant. Besides the Russian orderly each officer foun it necessary to have at least one servant, usually a Chines Also, in course of time, it came to be the custom to detail fo each officer a mounted orderly, either a Cossack or a mounte infantryman, in order that he might have always an escort both for his protection and identification. Until this mounte orderly was furnished, the officers were very much restricte in their movements, as their uniforms were unfamiliar to th army, and they were not only incommoded by frequent detention, but were absolutely in peril in case they went among th outposts. There was also a considerable danger from th great number of bandits who infested the country.

Up to about the 1st of June the attachés were retained at Liaoyang preparing their outfits and acquainting themselves with their surroundings and their needs. It was the custom of the commander in chief, at irregular intervals, to review the troops which had arrived from Russia and inspect their equipment preliminary to their being assigned to duty at the front. To those reviews were invited the foreign attachés, it being customary to also invite them to lunch with the commander in chief after the review. They usually met at luncheon the commanding officers of the troops reviewed and in this way they were able to familiarize themselves, more or less, with the organizations and make acquaintance of the prominent officers. It was also customary to invite the attachés to be present at special religious ceremonies on certain feast days. The ceremony usually consisted of a mass in the chapel, with the commander in chief and his staff prominently present. The mass was followed by a review of at least a battalion on a small parade ground near the chapel, and this was usually the occasion for showing some mark of distinction to the troops.

The commander in chief was very practical in his views on the subject of uniform and did not encourage, or at least did not require, the wearing of other than field dress, his own costume being always extremely neat and exact, but always one of the simpler forms of the varied Russian uniform. Most of the foreign officers present had their full-dress uniform, and following the customs of their own countries were in the habit of wearing it on ceremonial occasions and also on Sunday.

At an early date we were directed to divide our baggage into three lines. The first line was the light baggage, which was to accompany us in the field with troops. The second was the reserve of similar baggage, to be left in the baggage car or in the quarters at Liaoyang. The third was to include the winter outfit and all unnecessary impedimenta, or all impedimenta unnecessary for use during the summer, and was to be sent in a special baggage car to Harbin. This followed the rule governing all army baggage and proved a very practical arrangement. The tendency was to carry too much baggage in the first line, for many of the foreign officers had never seen much field service and events proved that he was the wisest who reduced his first-line baggage to what could be carried on either one or two pack horses. The attachés of the several countries differed very much in their equipment, giving a good opportunity for comparison of the different systems. So far as horse equipments were concerned we, the Americans, had very little to learn, but in one respect we had a great deal. Different continental armies have worked out the general-staff requirements, both during war and during their annual maneuvers, to a very practical point. In this the Germans undoubtedly excel, although the English have much that is worthy of observation. The Austrians also have well-developed methods and their officers, as well as those of the other nations I have mentioned, show the result of obtaining during the maneuvers their training for the very work that they were during these campaigns required to do. In the case of both the English and the Germans, when an officer is detailed as an observer the Intelligence Department stands ready to issue to him, intact, a dispatch box containing everything that will be necessary in the field. The English dispatch box is somewhat heavy, being made of metal and covered with leather, so as to be carried like a small suit case.

The German dispatch box is of pasteboard, covered with linen, is simpler and lighter than the British, but is also complete, the details being especially well worked out. The notebooks are of the right size for the pocket and thin enough so that if one be damaged the loss is not great. The paper is always ruled in quadrille on approved scales. This notebook has been copied by other armies, notably the Norwegian and Swedish. In the dispatch box also is carried a number of very small bottles of colored inks, a number of scales and protractors, and the usual variety of pencils, both black and colored. There was also furnished a transparent map case of some practical design with orienting compass.

The best map case I saw is one recently designed in the French service and of which I procured a number in St. Petersburg to send back to the Americans still doing duty in Manchuria. I have also deposited a specimen with the chief of ordnance in the hope that it will be adopted in our service. In the field the best map case is the one which is least in the way and which, while keeping the map perfectly dry, can be put in the pocket or in the dispatch bag, as the occasion requires. The compass for orientation need not be large, a diameter of one-half inch being quite sufficient.

As to maps. Fear existed that they might fall into the hands of the enemy, and while there was a very accurate and carefully prepared map on the large scale of two versts to the inch, of some of the southern provinces as far north as Liaoyang, copies of this map were refused to the attachés individually, although two copies were furnished for their collective use. These copies soon disappeared.

The impossibility of procuring maps made it difficult to understand the changing phases of the situation, and in fact the impossibility of procuring sufficient information of any kind rendered it impossible to see correctly and to understand what was seen. It was impossible to procure copies of the orders issued to troops. Our knowledge of events therefore was limited to the visual radius.

About the 1st of June as soon as it became apparent that a forward movement would be made by a portion of the army, the foreign attachés were consulted as to their desires for assignments and were then told off to various army corps. Before they departed, however, for their several headquarters, six of them, representing five different countries—France, Germany, Austria, England, and Spain—were invited to remain with the headquarters of the commander in chief of the army. The omission in this of the United States was no doubt due to the fact that I had expressed a desire to see the cavalry.

This worked in the end to my advantage. Perhaps because it enabled me to see certain things which I would otherwise have missed; and I very soon discovered that I was not properly outfitted for service with mounted troops. For such service an attaché should be properly mounted on a large and strong horse and he should have his baggage reduced to what can be carried on one pack horse, so that his entire establishment shall consist of himself and an orderly, with a mount for each, and one pack horse carrying among other things his bedding and a shelter tent and at least food enough to maintain him and his servant for five days.

CEREMONIES.

Before my arrival with the army an order had been issued by the commander in chief prohibiting the firing of salutes by cannon; so that from first to last we never heard a salute fired nor did we see a parade of guard or other troops as a compliment to officers other than those of very high rank. It was customary for the commander in chief to visit all parts of his command frequently, and on such occasions he often reviewed the troops, sometimes with considerable formality, sometimes with very little, his idea apparently being to dispense as much as possible with ceremonials. Reenforcements arriving from Russia were usually reviewed at Liaoyang, whence they were dispatched for incorporation into the grand divisions of the army. Occasionally regimental or division reviews were held when the troops were to receive special commendations or decorations.

Each regiment in the army has, ordinarily, a fête day, which is observed with some ceremony and feasting. It is customary on such occasions to have a religious ceremony for the blessing of the regimental banners and icons, followed by a review and later in the day a dinner by the officers and a similar celebration by the soldiers. A distinguished instance of this sort was the fête given by the Twelfth Siberian Rifles. The occasion was the receipt of a telegram announcing that the newly born heir to the throne had been appointed titular colonel of that regiment in recognition of its very distinguished services during the war and especially at the Yalu. It sometimes appeared that the observance of such festivities interfered in some degree with the conduct of military operations. This may have been more apparent than rea but the occasions were so constantly recurring, even in th midst of campaigns, that the foreign observers were im pressed by it. Russian holidays are notably frequent. case occurred on the 4th of August when administratio offices were closed for the observance of a holiday in th midst of a busy season and when it was certain that a cessa tion of business must work serious injury to the interests o the service.

The commander in chief frequently inspected organization in the field and always took a look at important positions On September 13, while still with the staff of the Seventeent Corps, I was invited to accompany the commander in chief o an inspection of the corps in their bivouacs south of Mukde and guarding the numerous bridges over the Hun River Riding from east to west we came first to the Thirty-fifth Division and its artillery brigade. The regiments were formed without arms in front of their bivouacs, which had been cleaned up for inspection. The artillery was formed likewise, leaving the guns in the park. The general passed through one organization after another, in each case the men filing off to their shelter tents after the line had been inspected. Then we came to the infantry of the Third Division and in rear of it the Third Artillery Brigade. This covered the railway bridge, as well as certain floating bridges of Chinese boats recently constructed. The advanced guard of both divisions was posted in the works of the fortified bridge head south of the river. This was the first time I had seen the corps inspected since before the fighting at Liaoyang, and the shrinkage of the battalions was very perceptible. The response of the men when ordered to cheer lacked the enthusiasm of the old days, and there was a general air of despondency. The Russians are emotional, and like Asiatics are much elated by any prosperity, but correspondingly depressed by a reverse, the alternation of moods being sometimes rapid and marked.

Religious ceremonies are frequent in the army, including the chanting of the morning and evening prayers. It is customary also to chant prayers before going into battle, and this is a most solemn and impressive ceremony. The music is always sad in sound, and I believe is better calculated to depress the spirits of the soldiers than to elevate them. We did not understand the words—perhaps the soldiers did not either—but the impression always made on our minds was of people expecting and preparing to be defeated. This impression was not dispelled by such conversation among the soldiers as occasionally came to our ears.

STAFF.

Upon the subject of staff and general administration it is impossible to make a report of any value, as but little information was available, and investigation in these lines was not encouraged. The several army corps varied considerably in the magnitude of the headquarters establishment, but in all cases one remarked the simplicity of it. The four corps that I had occasion to observe had each but one typewriting machine at headquarters, and the staff of clerks was not numerous. Usually the division headquarters was equipped with a typewriting machine, although the practice was not universal. At corps, division, and regimental headquarters neither the promulgated orders nor the correspondence was voluminous, and although at each headquarters there was a sufficient number of staff officers to conduct all the necessary business, they were not apparently closely occupied, except in the case of the chief of staff, who was always a busy man. Each corps and division commander had, in addition to his administrative staff, a number of aides-de-camp, which is translated into Russian by the word adjutant. Their duties did not differ from the practice of other armies.

ARTILLERY.

The first use of guns of caliber larger than the field piece was at Liaoyang. Two batteries of guns of about 4-inch caliber, supposed to contain four guns to the battery, were placed in position on a low ridge northeast of Shoushan Mountain and about 4 miles south of Liaoyang. I was extremely desirous of visiting these batteries, when on the 29th of August a number of military attachés had been taken to Shoushan Mountain by the general staff officer in charge of us. The proposition to look at the siege batteries was apparently favorably considered, but whether by design or accident the group got in a wrong road, and the project was abandoned, so that we returned to Liaoyang unsuccessful. During the bombardment of the 30th of August these guns could be distinctly heard, but on that night they were withdrawn to the suburbs of Liaoyang, where they were placed in position near the station, and were used to some extent on the 31st. On the 1st day of September, while preparation was being made to withdraw these guns by rail to the north, another battery of them arrived on a train from the north, but too late for use. After the withdrawal of the army to Mukden two batteries of these guns were placed in position in redoubts forming the bridge head covering the railway crossing of the Hun River, 3 miles south of Mukden. After the battles of the Sha River, and about the end of October, the Russians established on the railway near the village of Ssufangtai a battery of six 4-inch guns or howitzers, called by them the mortar battery. At the same time a battery of 4-inch guns was placed behind the village of Changchenpu, where we saw it in action on October 28. Early in November a battery of four 6-inch guns was placed behind the village of Podyavaza, and was used at intervals against a position to the south, where the Japanese were reported to have batteries of field guns recently captured from the Russians. These two last batteries, the one of 4-inch and the one of 6-inch, were completely screened by villages directly in their front, and, in addition, were sheltered by carefully constructed field works.

In connection with the 6-inch battery an interesting event was observed on October 31. This battery was subjecting the Japanese to considerable annoyance, and at the same time was so completely screened as to be impossible of observation by the Japanese. We were not able to ascertain the location of the observer for this battery, but believed him to be on Putilov Hill, three-fourths of a mile to the east. The Japanese, unable to locate the guns, apparently believed them to be behind the Putilov Hill, and on October 31 subjected that position to a fierce bombardment. The 6-inch battery meanwhile, being under no fire whatever, kept up its action.

The troops first in the field at the outbreak of the war were equipped with old pattern guns, the new quick-firing gun not having been issued to any great extent to the troops in the organizations in the Far East. Upon our arrival at Liaoyang we found in the hands of the troops at least four types of gun—the old pattern field gun, with fixed ammunition, certain batteries of mountain guns captured from the Chinese in the Boxer war and subsequently utilized for the equipment of Russian organizations, several batteries of mountain guns which, it was understood, had been bought from a South American government, and the newest quick-firing gun just being issued to the army. In addition, there were field howitzers, as described in the Russian regulations, and there were lying at Liaoyang in the railroad yards the guns of about 4-inch caliber which had been withdrawn from the fortifications of Yinkou and sent to the rear to prevent their falling into the hands of the enemy. The mountain guns at this time in use were not all arranged for packing on animals, but were conveyed by draft animals. In the early engagements of the war the Russian officers were much prejudiced against these guns, and considered them an element of weakness rather than of strength. This comment was frequently heard. The guns appeared to be of less power than those of the Japanese, and were apparently outclassed by them.

The Russian artillery met with disaster in the early engagements, losing guns in large numbers at the crossing of the Yalu and at the battle of Telissu, and it was evident for a long time afterward that the commanders of corps and divisions were reluctant to expose their artillery and seemed actually timid about putting their guns into action. I can only state this as the current report of the time, but it can be substantiated by a study of the operations of General Keller's eastern detachment in the mountains covering Anping. It was, however, a matter of common observation that the Russians did not understand how to use their artillery to the best advantage, and held too much of it in reserve.

As late as the 16th of October, when the results of the battles on the Sha River depended upon a vigorous effort to retake from the Japanese the position of Putilov Hill, which enfiladed the Russian line, and when preparation was made for the assault of this position by a force of five regiments the artillery bombardment was participated in by only eight batteries, while at least 200 guns were available for this purpose and were lying idle. As the preliminary assault on this position by daylight had failed, and as so much depended on the capture of the position, it was impossible for us to understan why more guns were not brought to bear upon it, the terrai admitting of practically unlimited number.

The artillery troops were equipped as rapidly as possibl with the new quick-firing gun, but the batteries arriving fron week to week (almost from day to day) by rail from the west while they brought this gun with them, had to admit that the had had no practice whatever with it and were entirely unfamiliar with it. An effort was made to give them the necessary training as speedily as possible, but it was not always practicable to put them in localities admitting of target practice. All batteries, however, south of Liaoyang, at Tashihchiao, and at Haicheng were able to have some target practice and get their men more or less familiar with the arm. The equipment of the artillery was not all up to date even then, and as late as the middle of July it is doubtful whether any battery in the army was equipped with a telescope. The battery commanders, and, in fact, most battery officers, had field glasses, though not usually of very high power; but the theory and practice of indirect fire were not understood and the equipment for it was to a great extent lacking. The early practice was to put the batteries in position for direct fire, and often, as on the Yalu and Telissu and in the eastern passes, the gun emplacements were conspicuous objects in the landscape and the guns in consequence subjected at once to heavy fire. This was due, not only to the ignorance of modern artillery practice, but to the traditions of the Russian army, the use of cover not being understood nor its importance appreciated.

The new field gun, being heavy, was ill adapted to travel on Manchurian roads in the wet season, and in addition to the exhaustion of the animals, guns and ammunition wagons were several times lost through abandonment in the mud. A notable instance of this was the loss of a battery by the rear guard of the First Corps on the withdrawal from Anshantien to Liaoyang in the latter part of August.

It was customary for artillery on the march to carry not only a large amount of grain on the limbers, but also as much hay as could be packed on the carriages. In the absence of hay the long forage consisted in millet of both varieties, the short stalk and the long one, and after the crops had ripened in the country the customary aspect of a battery on the road was with the guns almost entirely concealed by the superincumbent load of forage.

The horse batteries were few, being limited to a few Cossack batteries already on duty in the country when the war broke out, a small number of Cossack batteries brought out in April and May, and a division of horse artillery consisting of two batteries which had been serving in Warsaw and were admirably horsed and equipped with quick-firing guns. In the light batteries, while on the march, cannoneers very seldom rode, but ordinarily marched on foot with the guns. In fact, as a rule, the roads were so bad that it was necessary to lighten the carriages as much as practicable.

Some of the Cossack batteries and the mountain batteries of the frontier guards consisted of but six guns, but the regulation Russian battery has eight guns, and the batteries are seldom divided in service. Occasionally one saw a half battery acting independently, but rarely a less number of guns than four was to be found in action, and then only in the advance-guard work.

The personnel of the artillery was noticeably better than in the infantry or cavalry. The officers are, as a rule, graduates of the special school for their branch, and are intelligent and well instructed, with a strong esprit de corps. The regulations contemplate the presence of five officers with the battery—a lieutenant-colonel in command, a captain, a second captain, and two subalterns. Enlisted men of the battery were evidently selected with special reference to their intelligence and adaptability. I was not especially impressed by them in the light batteries, but in the European horse batteries I found the best appearing enlisted men in the army, with the possible exception of the European dragoons, who seemed to be about the same class of men, young and active and well set up. The batteries were well supplied with transportation of the kind in vogue in the army and were able to carry sufficient supplies to make them quite independent of reserve transportation.

The Cossack batteries, both light and horse, which had been serving in Asia, used horses of small type, but of a little better class than those upon which the Cossacks were mounted. The European batteries were well horsed with large horses, though their horses did not appear to be heavy enough a were of the light-carriage type.

In the artillery harness no steel collars are used, and t tugs are of rope of about 1 inch in diameter. The dista between the teams is noticeably great, especially between t leaders-and the swings. This was manifestly an advanta in the wet season in that country, where mud holes were numerous and so deep.

The ammunition is fixed and is carried in fragile wood trays which slide from the rear into the limbers. During t rainy season it was quite a common spectacle to see guns a ammunition wagons with their teams floundering in the mu while the Cossacks were assisting them by carrying the ca tridges in the nets with which they were provided for t transport of hay.

In the service of every artillery brigade there is a flyi park of caissons which are designed to carry ammunition f small arms as well as artillery. During the battles at Lia yang and on the Sha River these trains were observed movi back and forth between the firing positions and the base, a thus could be explained why the batteries could keep up continuous a fire. On certain occasions the expenditure ammunition was enormous.

In the action at Tashihchiao on July 23 the Japanese ba teries bombarded the Russian positions all day, and but o projectile took effect, killing and wounding 5 men. On Ju 24, the day of the Japanese assault, it was officially report that one Russian battery fired the incredible number 4,800 rounds in the 8-gun battery, the allowance for the car paign being 600 rounds per gun.

This and several similar experiences led to a general ord from the commander in chief directing economy of ammun tion.

After Liaoyang, where the Japanese used up all the ammunition, their economy of it was very marked. In th battles of the Sha River I saw many instances of liber expenditure on the part of Russian batteries with but litt reply from the enemy. The Japanese appeared to occasio ally send a few range finders at the Russian positions, g them definitely located, and reserve their heavy fire unt they could accomplish a certain result.

The Russians, as I have said, were slow to adopt indirect fire, but in time they learned their lessons thoroughly and as early as the battle of Liaoyang some of their batteries were so well concealed that the enemy could not find them. After the battles on the Sha River the screening of the batteries was scientific, though they still lacked the most modern telescopes.

On the 3d of September I visited a signal station on a mountain top overlooking the Taitszu River, and almost directly east of the headquarters of the Seventeenth Corps, in the village of Chouchingtzu. From this point could be seen the entire panorama of Liaoyang in the distance on one side, and on the other the valley of the Taitszu, with the Russian pontoon bridges about 10 miles distant. Directly across the valley, and firing at intervals upon some Russian positions in the valley, was a Japanese battery. Below our point and in the same range of hills at about 300 feet vertically below the signal station and about 700 yards northeast of it was a Russian battery directing its fire upon the Japanese battery at a range of over 6,000 yards, and on information transmitted by telephone from the signal station after each shot. After considerable firing the Russian battery was able to break shrapnel over the Japanese position, but the range seemed too great for accuracy. It was, however, an interesting exhibition of indirect fire.

About the end of October there arrived from Russia mountain guns of a new type, and up to the middle of November eight batteries had been assigned to duty with the army. The officers with these batteries, having just arrived from Russia, were unaccustomed to military attachés and were very reluctant to show us their equipment and to permit of such an inspection as would have given an opportunity for description. The gun was arranged to be carried by five pack horses, the trail separating from the main carriage. A pair of shafts was supplied for each gun and they appeared marching on the roads both packed and hauled. In the latter case each piece was pulled by two horses harnessed tandem. As far as one could see, the piece when hauled was completely reversed and the shafts so adjusted that the carriage was upside down. The spare parts were carried by pack horses. The ammunition was arranged in steel cases carrying 5 rounds each, each pack horse carrying 10 rounds. I addition to the usual spare parts carried with the batter there was a complete piece to be held in reserve, so that eac battery had 9 guns. These batteries were evidently completely new and very well made. We were informed tha they had been on experimental practice in the Ural Mountain for some weeks before coming east.

Just before leaving the army I saw two batteries of thi piece parked near the advanced Russian line at Pienniulupu and on November 4 we also encountered a number of batteries on the march toward Erdagu Hill. These last were of two different types, the one for packing, as just described, and the other without that provision. In the latter battery the gun and limber were each drawn by four horses.

About October 21 the Russians occupied the town of Shahopu, from which the Japanese had withdrawn the preceding night. They found there in the Japanese works a number of dummy guns made of wood, no doubt placed there for the purpose of misleading the enemy as to the actual position of the Japanese batteries. It was reported that there were 24 of these quaker guns in position. Some days previous to this date the Russians had placed a battery of 4-inch guns for the purpose of dominating the village of Shahopu, but it is not known whether the fire of this battery was diverted by the dummies.

CAVALRY.

The only European cavalry which had reached the army up to the time of my leaving it on the 1st of December was the brigade attached to the Seventeenth Corps, and made up of the Fifty-first and Fifty-second dragoons. In November I occasionally saw dragoons of the Fifty-fourth and Fifty-fifth regiments, but I never saw these organizations nor anything that looked like considerable fractions of them, and I was unable to ascertain whether these men were orderlies attached to some corps headquarters or whether their squadrons were present with the army. The brigade that I have mentioned formed part of the permanent organization of the Seventeenth Corps. During the battle of Liaoyang I met on the staff a major-general of cavalry, who told me he was in command of this brigade, but had not yet seen it. The

Fifty-first Regiment was detailed almost entirely at corps headquarters on escort and orderly duty and appeared to be much scattered. The Fifty-second was employed on the cavalry screen and did not appear to be diverted from its legitimate function as corps cavalry. This regiment was commanded by Colonel Stackovitch, who had had experience as an observer with the British army during the South African war. The regiment was well equipped and mounted on European horses, all gray, and the men appeared of an average age of about 24. In this respect they differed radically in appearance from the Cossacks, who seemed to be of more mature age. Among the Siberian troops was found the regiment of Primorsky dragoons, which, except in name, differed but little from the Cossacks, and in which were serving many officers from the guard regiments at St. Petersburg for whom positions had been found or made in the far eastern troops. There were other Asiatic dragoon regiments reported, but so far as we could see they were indistinguishable from Cossacks. There were also regiments from the Caucasus, chiefly distinguished by and for their peculiar dress. They were never particularly efficient and impressed all observers as being rather for show than for use. An officer in the Cherkess, as the Caucasian robe is called, and with silver-mounted dagger, lambskin papaka or headdress, and a scarlet bashlik hanging around his shoulders, always gave an air of picturesqueness to the staff of a general. Most of the Russian officers are uniformed for picturesque effect. The Cossacks formed the mass of the mounted troops and were always in evidence throughout the army. They bear many territorial names and they differ in color of their facings, but very little in other characteristics. Those from eastern Siberia, the Kuban, the Terek, the Ussuri, and the Amur, carry no lances, but in all other Cossack regiments the front rank carry the lance, which is a pike about 9 feet long, without pennon, with quadrangular head and weighing about 7 pounds. Of the Siberian Cossacks and those from the eastern provinces great numbers were evidently pure Buriats or of other native tribes of a type somewhat similar in appearance to the Eskimos. These men were not well versed in the Russian language nor do they seem to be particularly intelligent. The Cossacks from the western provinces, from the Ural and from the Don, did not seem to differ from other Russians. They were mostly reserve troops and to all appearances averaged about 35 years of age, with full beards, and, of course, speaking Russian as their native language.

It is to be remembered that the original Cossacks were simply renegade Russians, who sought the frontiers for the freedom of the life, there married women of outlying tribes, and became more or less wild men. Originally they were organized into military colonies with the idea of utilizing them for the protection of the frontiers. Their semi-independence was recognized to such an extent that in course of time they became practically tribes; one might almost say, a nation by themselves. As the development of Siberia progressed, it came to be the custom to plant in the new territory military colonies of these people. At first they were known only as active horsemen, and were organized as cavalry of a most irregular sort. Within recent time, both infantry regiments and light batteries have been raised among them to some extent, so that now the army contains not only the mounted troops generically known as Cossacks, but also Cossack infantry and Cossack batteries, always distinguished by the territorial name, as, for instance, the Trans-Baikal Cossacks, the Ural Cossacks, the Don Cossacks, etc. The Don Cossacks, being one of the oldest Cossack establishments, have become rich and luxurious and their troops are more or less a corps d'élite among the other Cossacks. The Cossack draws no pay to speak of. He furnishes his own horse, but if lost in service the horse is resupplied by the Government. The Don Cossacks are the best mounted of them all, on horses of small size, compared to those of the European troops, and which show the Arab type very strongly. These horses appear light in weight and conformation, but are said to be very good indeed. The horses of the other Cossacks gradually diminish in size from west to east, the Cossacks from the Trans-Baikal and the provinces east of that being mounted on Mongolian ponies of about 12 hands; about the same animal as we know in the Philippines as the China pony. The Trans-Baikal and Turkoman ponies are a little heavier, a little taller, and generally of a little larger type than the Mongolian ponies and seem to be exceedingly hardy. The waste of Cossack mounts, in the course of the present war, has ordinarily been supplied from Mongolia, so that the average mount of the Cossack has gradually diminished in size. The Cossacks are good riders and understand the care of their animals, but they are not especially solicitous about sore backs and they rarely walk to spare their horses. They never appear on foot when it is possible to ride. In spite of their very ungainly saddles, which raise the rider so that his center of gravity is very high, they seem to sit their horses with great security, and certainly ride them most fearlessly at all gaits and over any kind of country. This combination, however, of a small horse and a high seat induces many falls, but the men are tough and don't seem to mind it much. Of Cossack discipline it is not easy to speak with certainty. They certainly have great respect for their officers, and in common with all Russian soldiers have no thought of insubordination, but they are very lax in certain observances, and especially in retaining their formations. This is especially noticeable in their marching, and particularly in making and breaking camp. I have watched many Cossack sotnias, or companies, leaving their bivouacs, and have rarely seen any attempt at a formation. The men apparently mount their horses and flock out gradually, getting together in column on the road. Whatever their regulations may be, they certainly never get in the way of other troops and never interfere in the slightest with marching infantry or artillery. These peculiarities are well known, but what the world expected of the Cossacks was very efficient scouting and outpost duty and very great independence in the performance of that work. The foreign attachés, and even the Russians themselves, were somewhat disappointed in this and it is said that even in Russia there is severe criticism of the Cossacks as being an antiquated institution. In Manchuria it was plainly apparent that the Cossacks had been bred on the Steppes and could not understand service in the mountains. They showed a strong aversion to mountain climbing, and this was often their undoing; for in patrolling the country they stuck to the valleys, ignoring the fact that the Japanese held the hills. This was so patent that the peculiarities appear in the Japanese caricatures. All observers agreed that their patrolling and outpost duty was badly done and very ineffective, and while the officers of the Cossack organizations criticised the Japanese as timid, on account of the painstaking care with which they scouted th country before advancing, the fact remained that the Japanese had better information of their enemy than had th Russians who were opposed to them. The Cossacks wer personally very untidy and uncleanly, but one could not hel admiring the facility with which they took care of themselves and the indifference with which they exposed themselves t hardships of all kinds. They think nothing of going lon without food and appear to suffer but little from sleeping o wet ground without covering, and they certainly found n particular discomfort in sleeping not only in their clothe but in their entire equipment. What they seemed to particularly enjoy, in hot weather, was the fording of stream deep enough to thoroughly wet them. It never seemed t occur to them that it was uncomfortable to ride in wet clothes. Fortunately the streams of Manchuria had no quicksand, and no Cossack on approaching a stream, whether deep or shallow, hesitates for a moment about plunging into it. Like all people who are constantly associated with horses, they understand something of swimming them, but they differ very much in this respect and only those were distinguished in the way of crossing deep water who had lived near large rivers in Siberia and had been drilled in crossing those rivers as organizations. The Cossacks have a great reputation as marauders and this seems to be well deserved, largely because they are encouraged in foraging by their officers and the fact that their subsistence depends largely upon their own exertions. A large number of the younger officers of the regiments of guards stationed in St. Petersburg were given Cossack commands, in many cases being made the senior captains of sotnias. At first this was resented by the permanent officers of the Cossack organizations, but as time went on I think that feeling wore off, as the casualties were so numerous that there was no lack of promotion. The word "sotnia" means 100, just as a dozen means 12—a century, in other words. The word "sotnia," as applied to Cossacks, corresponds to squadron in the regular cavalry, and a sotnia is not necessarily 100 men, but usually 172. The sotnia has a similar organization to the squadron and has a senoir and junior captain, with a proper complement of lieutenants. The senior captain is responsible for the administration of the squadron, and by the peculiar system in vogue in the Russian army he handles the funds necessary for the payment of the men and purchase of subsistence stores. It follows that with successful foraging the saving on the rations is considerable.

The Cossacks, and in fact the cavalry generally, lack the marching kitchen, or what we call the soup cart, and they are supposed to travel only with pack animals and to preserve a mobility that would be interfered with by wheeled transportation. At the same time, they do use wheel transportation to a considerable extent, and it is not apparent why they should not have the traveling kitchen, which could be always left with their second line baggage. I saw cases where the Cossack organizations had acquired the traveling kitchen, but whether it was regularly issued to them or simply borrowed, I could not tell.

A very admirable feature of the Russian mounted troops, as well as of the infantry, was their noiselessness. Their equipment was so disposed that there was neither jingle nor rattle. There is but little use of trumpet calls and the shouting of orders is not conspicuous. All this was noticeable both on reviews and in the routine work.

Furthermore, they carried nothing to glitter. In watching mounted parties at a distance I could occasionally discern a faint glimmer, as of dull metal, never a brightly shining point.

MOUNTED INFANTRY.

It being recognized that in every infantry regiment there must be mounted men for use as orderlies and couriers, provision is made in time of peace for 32 mounted men in each regiment.

In time of war the number is increased, whether by a definite number or not can not be determined, but in June we found that in each Siberian regiment of three battalions there was an organized mounted detachment of 142 men, formed of soldiers specially selected and detailed pro rata from the companies of the regiment. At that time the aggregate number must have varied considerably, as the commanding officer of one regimental mounted detachment told me that he had as many as 17 men from each company. These mounted men go ordinarily by the name of okotniks or volunteer scouts. They are organized as a company and are used to good advantage as scouts and couriers, and especially as patrols on the outpost line. At Kaiping in the month of June, when there seemed to be a possibility of the Japanese attempting a landing, the okotniks shared with the Cossacks the duty of patrolling the coast, and as their equipment seemed to be similar it was not always easy to distinguish between them, although, as a rule, a detachment of Cossacks would carry a few lances. The method of employing the okotniks in the several regiments seemed to differ, but in most of them they were organized and utilized as a troop for the service of security and information. It is said that one of the most valuable elements of General Mistchenko's cavalry command is a mounted detachment of a rifles regiment, which became separated from its regiment at the time the latter was shut up in Port Arthur. The detachment joined General Mishchenko, who at that time was in command of a cavalry force operating in the Peninsula near the point where the Japanese cut the line, and he subsequently retained these men. As the men for the mounted detachments are always selected for their intelligence and marksmanship, this particular body, coming as it did from the Rifles, who are furnished with the best class of recruits, proved of higher efficiency than the Cossacks with whom they were associated in Mishchenko's command, and they can always be relied upon for bold scouting and for extricating themselves from dangerous situations. They were particularly successful in cutting out prisoners when it was desired to obtain such for the purpose of identifying the forces found in Mishchenko's front.

SERVICE OF SECURITY AND INFORMATION.

The summary of all my observations in the matter of the service of security and information is that it was not, as a rule, well done. Three circumstances contributed to this end. At the beginning of the campaign there existed in the minds of all the soldiers a contempt for the enemy, which was only corrected after considerable experience. The opinion of the enlisted men then swung to the opposite extreme. Secondly, the Russian soldier was unfamiliar with hills and mountains, and it is difficult for him to learn how to take care of himself in broken country. This results in an incapacity for comprehending the value of cover and in learning how to utilize it to advantage. Thirdly, the individual soldier has no initiative and is helpless when thrown on his own resources, so that no efficient scouting or outpost duty can be expected of him without the presence of an officer. Ignorance of the use of cover is not confined to the rank and file, and time and experience were required to teach even the officers to keep off the sky line. The characteristic aspect of a Russian sentinel or vedette is standing erect in a conspicuous position, so that the location of the outpost is readily seen. This is especially noticeable when the post is on a mountain peak, and it was often a question as to which were the more conspicuous, the straw-covered beacon prepared for a night signal or the sentinel on duty near it.

While the Russian outposts were as a rule visible to the enemy, it was rarely possible, even with long scrutiny, to locate the enemy's outposts, except on occasions when a procession of coolies could be seen bringing them their meals.

One of the most important comments made by observers of the field operations of Mishchenko and Rennenkampf was that the Japanese cavalry when exposed at once dismounted and took cover, invariably dismounting to fire, while the Cossacks did not understand the use of cover and frequently fired mounted. I had no way of knowing as to how well the Japanese cavalry kept the touch of the enemy, but I know that the Russians frequently lost it, whether working on a small scale or in large bodies.

The Cossacks and the Okotniks of the infantry are admirably adapted to patrol work, but suffered from the lack of intelligent noncommissioned officers. Parties of these troops were to be seen constantly going about the country within the outposts, but we were never in a position to see them in front of the lines. Just how effective their work may have been in exploration for the enemy we were never able to determine, but we were not agreeably impressed with what little we could hear of the results.

The scouting by officers' patrols was always daringly done, but with the same disregard of cover observable in all the outpost work. Later specially enterprising officers were detailed with picked detachments for this work, and the manner of it was much improved.

Very few of the officers were instructed in the making of topographical sketches, and one rarely saw an effective map made by a scouting officer. The admirable two-verst map, made previous to the war, extended only to a short distance north of Liaoyang, and although from the start a withdrawal from Liaoyang was always contemplated by the commander in chief, the map of the country north of Liaoyang and in the neighborhood of Mukden when issued after the army had withdrawn to Mukden was found to be a compilation of detached road sketches with many gaps and with conspicuous errors. It was only after the battles of the Sha River in October that a resurvey was made of this country, then already occupied by the army. The resultant reasonably correct map was made on a scale of two versts to the inch. Occasionally in riding about the lines an officer was met who was engaged in map making with a plane table or a cruder apparatus, but these encounters were very rare, and it was evident that much less of this work was being done than one should expect. It is well known that the maps of the country were so defective that, especially in the mountains, it was difficult for contiguous units to keep in touch or even in communication, reliance being placed chiefly on Cossack patrols.

INFANTRY.

A special report on the infantry arm is to be made by Captain Reichmann. Therefore, to avoid repetition, I will make but a brief paragraph on the subject.

A large proportion of the foot regiments were from the Asiatic colonies and included not only pure Russians, both those migrated from Russia and those born in the colonies, but also the natives of many Asiatic tribes. A large proportion of the men also were reservists and men who had performed their military service and passed into the first line of reserve, being mobilized for this war, and showing an average age greater than that of the men being trained in the active army.

The equipment of the infantry is heavy, amounting to 66 pounds per man, and is distributed on the person so as to put a large part of the load about the hips. No bayonet scabbards are carried, the bayonet being always fixed on the rifle. The mess tin is a small bucket holding two quarts, and of which the diameter at the top is somewhat less than that of the bottom. It was made of aluminium, but this metal was found unserviceable and the use of tinned copper was resumed. This is carried with the ends of the blanket roll stuffed into it, so that it does not rattle against any hard substance. The excessive weight and inconvenience of the pack was shown especially on the retreat from Tashihchiao to Haicheng on July 25, when there occurred so many cases of heat prostration that the commander in chief was compelled to issue an order providing for the relief of the individual soldier by using transport for part of his equipment. It is customary, though not invariably so in preparing for action, to deposit the packs on the ground and leave them to be subsequently recovered after the action. I had occasion to observe this practice on September 2 on the mountains overlooking the village of Sahutun. Two regiments held in reserve behind the crest of the mountain were about 3 p. m. ordered to advance in support of troops already engaged. The men left their packs where they happened to be, without any effort to assemble them, and moved forward to the crest. In walking along the line of packs I observed that they had left their intrenching tools with them, the Linneman spades being so numerous that they must have been well equipped with them.

The footgear of the soldier is a cloth wrapping in place of a stocking and a long boot of soft leather. The boot is much lighter than it appears and is made with a spring heel.

The formation on the march is dependent on the width of the way and can be best described as marching by the roadfull. If the trail be narrow, the men, seemingly without command, fall into a column of fours, or threes, or twos, as the case may be, but if it be broad they form a throng covering the entire width and well closed up without apparently endeavoring to keep any formation whatever; but they are evidently trained to this method, and there seems to be no disorder. The pace is slow. Field music is seldom used, its place being supplied by the detailed singers of the companies. While the rate of marching is not rapid, there is always a good deal of running observable among the rear files of the companies. In a column which has marched some distance it is evident from the gait that there are many sore feet, but the high boot has an advantage in the mud, which would be greater if it were only waterproof, but it is not. In fording rivers, if the march is leisurely, the men are ordinarily permitted or required to strip from the waist down, but if the march is hurried the boots are not removed. The chief characteristic of the marching is that observable with all arms of the service, namely noiselessness. Silence of the marching Russian column is very noticeable. On September 7 I waited for some time in a Chinese dooryard, surrounded by a high mud wall, and was conscious that I was in the midst of an army on the move, as from a road at some distance came the sound of Chinese and Russian drivers urging their teams. Upon going to the gate I was astonished to find that an entire division of infantry was marching past the wall and making so little sound that I I had been oblivious of it.

The infantry is supplied with the marching kitchen (pohodnia kuknia) or soup cart, there being 14 to a regiment—one for each company and detachment and one for the headquarters. Occasionally soup is made while moving, but the function of this apparatus is not so much to cook while moving as to be prepared while moving to cook immediately upon a halt or, having cooked at a halt, to be prepared to issue the soup at any time. A soup cart for an army which is willing to take its food in the form of soup and carries no equipment for frying is a most efficient apparatus. Where it fails to be superior to the individual cooking apparatus is on those infrequent occasions when on a long march over rough ground it is impossible to keep the fires going and the fuel is wet, so that after the final bivouac is made a long time is necessary to do the cooking. The beginning of the process is somewhat slow, as the volume of water in the kettle is great, and unless the fire be somewhat fierce a long time is necessary to bring the water to the boiling point. Except under extraordinary conditions, the infantry soldier has always at least one good meal a day of soup and boiled meat, the soup including all the vegetables that it is possible to procure in the country.

The attack on Putilov Hill by the Russians on the night of October 16 can be rightly described as a bayonet fight. Certain of the five Russian regiments advanced without firing, after the position had been heavily bombarded by artillery, and when they reached the first line of intrenchments of the

Japanese the latter were so astonished as to be for a moment paralyzed. The Russian description of the ensuing contest stated that in some cases the assailants were actually lifted off the ground on Japanese bayonets; that there was much striking with the musket, but without presenting the butt. The colonel of the Russian regiment was wounded by a bayonet thrust. Investigation shows, so far as it is possible to procure evidence on the subject, that in a fight of this character the Japanese bayonet was more effective than the Russian quadrangular bayonet of the old-fashioned form.

In the months of July and August several bayonet assaults were made by each side in the eastern mountains. On the night of July 3 a Russian regiment was sent forward to reconnoiter the Japanese and ascertain whether they were holding the passes in force. The orders were to use the bayonet only and fire no shot before daylight. The Russians succeeded in penetrating to the second line of works with the loss of about fifty men. In the morning they withdrew by daylight, through the hills full of Japanese firing into them, and in this retreat lost about 300.

The formation for attack was in three lines, the first and second lines deployed. It is quite certain that early in the war this regulation was not always observed, for at Telissu on July 15 I saw a regiment of the reserve go into action in support of the right center of the corps with apparently no attempt to assume a regular formation. Unfortunately I was not in a position to see the entire maneuver, but I observed one battalion which was marching parallel to the front in column of fours suddenly face to the left and charge up a hill which was steep enough to destroy the formation. A little later I saw a battalion swarming up a steep slope to the support of a battery already in position on the crest of the ridge and against the sky line (without cover of any kind). The troops entirely in disorder began to arrive at the crest, and then my attention was otherwise diverted. During the battle of Liaoyang, from August 30 to September 3, I several times had an opportunity to observe infantry preparing to attack or already in action in proper formation. During the fighting on the Sha River, between October 8 and 17, surprisingly little disorder was seen, even in organizations on the line of retreat. Battalions in support of batteries formed for attack on the flank of the battery and were held in that formation. On th 16th of October, from the knoll near the village of Kuanshan the point of rest of the foreign observers, it was possible t see some details of the successive assaults on the Lone Tre Hill (afterward known as Putilov Hill), and the formation wa always in three lines, the first line deployed as skirmishers the second with less intervals, and the third in lines at clos order.

I have already called attention to the lack of proper scouting. Occasionally we were aware of similar cases elsewhere At times, even with considerable information about the enemy, there was lack of proper precaution. On or about August 1 the infantry of the Tenth Corps was attacked in its bivouacs near Lantzushan, south of east of Liaoyang. The Russians were thrown into a panic, with the loss of 2,100 men. This Tenth Corps had just come from Russia, and had the experience common to the recently arrived European troops. (The subsequent fate of the Sixteenth Corps at the battle of Mukden is a case in point.)

Contempt for the Far Eastern troops gives them an arrogance of superiority which almost inevitably leads to disaster. The Seventeenth Corps was exceptionally good, yet the Third Division lost over 5,000 men in the first two days' battles on the Sha River. The Seventeenth Corps also lost 34 guns in that battle, and the manner of their loss is interesting as showing the necessity for perfect coordination between the artillery and its supports. The infantry supports of the three batteries were of ample size, but through some error they were withdrawn without the knowledge of their artillery. The latter in course of time saw infantry maneuvering on their flanks and rear, but supposed, of course, it was their own. They were undeceived too late, when they found themselves surrounded and their officers and cannoneers falling rapidly under the infantry rifle fire.

MEDICAL.

The handbook of the Russian army gives a chapter on the medical establishment comprising the regulations for its organization, and begins by stating that in peace there is no medical corps in the Russian army existing as a unit by itself, and describes the small medical personnel belonging to each combatant unit. Provision is made for the expansion of the medical service on a war footing, but, as will be seen, provision is made only for a comparatively small number of sick and wounded.

Upon our arrival at the army headquarters our attention was soon called to the fact that the medical service of the army was as yet inadequate.

Following the precedent established in the Manchurian campaign of the Boxer war of 1900 and 1901, the Government had authorized the organization and equipment of the Red Cross auxiliary service, the gentleman in charge of it being the same who had developed the service during the Boxer war. Great activity was displayed in the equipment of field hospitals and of transportation for the conveyance both of medical stores and of wounded. A large depot was established at Liaoyang, where pack trains were outfitted with the greatest possible dispatch, as well as ambulance trains composed of the ordinary two-wheeled cart, or dvoukolka.

The animals of the country—that is, the Mongolian and Manchurian ponies and mules—were brought in in great numbers by the Chinese and were bought at good prices by the Red Cross Society. Other depots existed at Mukden and elsewhere, and the service was rapidly developed. Meanwhile the patriotic people of means in Russia equipped hospital trains for the railway, called "sanitary trains," and sent them as speedily as possible to the Far East. Not all of these trains were equipped at private expense, as some were prepared by the Government, but the former were the most expensively and elaborately outfitted and seemed a most admirable provision. The work of establishing large base hospitals was begun at Harbin, Mukden, and other railway stations. With these sanitary trains and the hospitals came a large number of nurses, both male and female, the large proportion of women being especially evident. Among these there were many ladies of refinement, and the most cultivated and wealthy society of the Russian capitals was represented. It was apparent quite early in the war that it was not easy for the hospital service to keep pace with the demand, and it was evident that had it not been for these patriotic societies of the Red Cross the medical department of the army would have been wholly inadequate to the necessities of the time. Gradually, as the need for better organization became apparent and as time permitted the appropriate changes to be made, it came about that the transport of the wounded and sick fell entirely within the province of the army medical corps, leaving the hospital service to the Red Cross. It was never quite easy to distinguish as between the army service and the Red Cross, and the establishments of the latter were found everywhere, even at the fighting line, and there were many casualties both among the doctors and nurses of the Red Cross Society. Every ambulance train that one met on the roads going to the front was accompanied by at least two women nurses, and these often of the most intelligent classes of Russian society. In fact, the extent to which these women were permitted to endure the hardships of the campaign was striking and remarkable.

The cart used for the transportation of the wounded was the ordinary army dvoukolka, fitted with white cotton cover and capable of carrying about two men. When, as frequently happened, the supply of these carts was not sufficient, the ordinary Chinese cart of the country was put in requisition, and during the great battles along the railway it was evident that every vehicle that went forward with supplies to the advanced lines or bivouacs was utilized to carry wounded to the rear. Occasionally there was seen a four-wheeled ambulance, but very rarely, and unless a wounded man was able to walk to the rear he was carried in a springless two-wheeled cart, on which a good deal of racking motion was inevitable. Officers of rank and men who were too seriously wounded to be carried thus were borne to the rear on stretchers, being carried in this way for very long distances.

In the equipment of pack trains for the medical service, at first the Russian pack saddle and canvas panniers were used, but the amount of this equipment being inadequate the ordinary Manchurian pack saddles were procured in great numbers. The sanitary trains on the railway were admirably fitted up with modern appliances and conveniences. Each train, as equipped, had a capacity of from 250 to 300 wounded, but this capacity could always be increased. The train was usually supplemented by the addition of common box cars, in which the sick and wounded could be carried without great discomfort; for, although these cars had no springs, the speed of the train was always slow. During the battles about Liaoyang and on the Shakhe River the sanitary trains were made to carry from 700 to 800 sick and wounded each. In addition to these regularly equipped trains, of course, an immense number of sick and wounded were carried in trains of ordinary box cars, the usual equipment for the transport of troops. Each troop train on the road was ordinarily made up of from 36 to 40 box cars with a passenger coach in the center of the train for the officers, so that when one of these trains was used for hospital purposes the surgeons and some of the nurses could use the passenger coach; but, as a rule, the nurses remained in the box cars with their patients. The box cars, as arranged for troops, are supplied with side cleats arranged for building by adjustable planks two platforms, one about 18 inches above the floor and the other at a height of 4 feet. Each car for the carriage of troops had a capacity of from 32 to 40 men, but naturally for the wounded the number must be less. Every effort was certainly made to properly care for the sick and wounded, but it was manifest, after a battle of the magnitude of those in Manchuria, the number of wounded was so enormous as to overtax the capacity of any army medical service in existence. This is especially true in a country like Manchuria after the cold season has begun and it is impossible to procure either sufficient fuel or sufficient appliances for its use. Irrespective of heating and medical service the provision of food alone for such an immense number of patients is a task of magnitude. Furthermore, the sanitary conditions in railway trains of box cars without plumbing or other hospital appliances and without a sufficient number of attendants is necessarily very bad.

By way of making provision for the great number of casualties expected in the spring, a call was made by the Government on the principal towns along the railway route for statistics as to the number of wounded that could be accommodated in case of emergency. Some of these towns are quite large, but they are distinctively frontier towns and not supplied with large modern buildings in great number. The responses to this demand were disappointing, but the final result has not been made public. The city of Irkutsk was called on to supply accommodations for 15,000 wounded.

The governor of the city reported that, after making a tho ough investigation and with the assurance of all possible co-op eration on the part of the people of the town, the largest num ber that could possibly be accommodated was 2,585, and tha even that number should be reduced as speedily as possibl The city of Krasnoyarsk, in response to a similar demand reported its ultimate capacity as 1,000. Irkutsk is a town o 70.000, and Krasnoyarsk claims 30,000 population.

SANITATION.

It is fortunate for the three nations involved in this war— Russia, Japan, and China—that they are all tea drinkers, an therefore habituated to the use of boiled water, for the sanitary conditions in Manchuria have never been other than abominable.

In the Russian army the troops first on the field were thos from the Far East, and regiments did not begin to arrive from Russia until late in June, and not very much was seen o European troops until August. The Far Eastern troops or generally speaking, the Siberian troops, were drawn from a pioneer population partly of European colonists and partly of native tribes. It was not to be expected that they would show a high development of sanitary science, but the almost total absence of camp sanitation in the early months showed not only lack of appreciation on the part of the troops, but lack of efficiency in the medical staff.

Regulations existed against the use of unboiled water and to provide for some sort of latrines in the camps, but the observance of these regulations was in the first case simply due to national habit and in the second case was totally lacking. No sinks were provided until the European troops began to arrive, and then they were of the crudest description and never constructed unless it was intended to stay for some time in the same cantonment. The only latrines provided for the troops were shallow trenches on the outskirts of the bivouacs. In the majority of cases there was no evidence of care or regulation for the covering of the excrement with earth, and had it not been for the desire of the Chinese farmer to procure manure for his fields the condition of these trenches would have been indescribable. As it was their use was not universal among the men, and the vicinity of a bivouac was a filthy place. At the etapes and in camps of more or less permanence there was considerable use of lime, and among the accumulated stores at Liaoyang there was a pile of many tons of this material. Its use, however, was in no place systematic.

Until the hard frosts came in November all Manchuria was swarming with flies. Mosquitoes were very numerous, as well as all of the other insects ordinarily to be found about an army, and especially about Chinese villages.

During the rainy season the fall of water was so great that in the level countries it sometimes lay on the surface of the ground to the depth of several inches, and the vicinity of every railway station was simply a stinking morass. At the end of June and the 1st of July I lay in a box car at Haicheng for three days waiting to be taken north. Both previously and during that time a great amount of rain fell, so that the old camp grounds of the troops, which had been massed at Haicheng, were covered with water in which floated all varieties of camp excreta and offal. During this time troops were marching in from the hills, seeking camping places around the station, and in many cases it was necessary for them to first form their bivouacs on water-covered ground until they could be gradually crowded upon drier spots. It was impossible to believe that the summer would be concluded without the occurrence of a fearful epidemic. At this very point, Haicheng, there was, in fact, a pestilence during the Boxer war of 1900–1901. That it did not recur in this year was probably due to the fact that during this rainy season military operations were so active that the troops were kept constantly in motion, and the place was given up to the Japanese before the end of the season. A few weeks later than the date above mentioned I observed near Liaoyang a very large hospital camp, in which I was told that most of the cases were dysentery and that they had been sent up from the army at the front. I had no means of knowing the number of cases of this description existing at that time, but I was afterwards informed that the sick rate in July and August was 7½ per cent.

The European troops brought with them a few machines for sterilizing water, but so few that it was only occasionally that one could be seen in operation. The apparatus acted on a Forbes-Waterhouse sterilizer, but was not so simple. It required wood fuel instead of petroleum and did not app to deliver the water sufficiently cool. Its use was not su ciently general for us to become familiar with it.

INTRENCHMENTS.

In the early months of the war the chief activity of the R sian army seemed to be in the preparation of positions, called. As the force available in Manchuria was too small hope for success if the Japanese made a serious advance force, it was necessary to cover all important points wi strong, defensive works. These were designed with care by t engineers, and the work was chiefly done by Chinese labore who were paid very good wages and employed in enormo numbers. The selection of positions was not always wise n skillful, and it was apparent that the engineers, as well many of the commanding generals, were novices. In illustr tion of this point I mention simply the tendency to put work on the sky line and to make the intrenchments the most co spicuous objects in the landscape. After the battle of th Yalu, and especially after Telissu, there was much improvement in this respect, and as time went on much of the wor was done by the army and less by contract. There was a indication that the army was on the defensive in the fac that whenever a foreign attaché visited outlying troop he always found the chief topic of conversation was th position, and if he were to be shown anything at all h was taken out to see the position. At the same time ther was no nervousness in the army nor any apprehension abou the final result, and the preparation of positions seemed t be more or less a national characteristic. At that time i was an ever-present idea in the minds and in the speech o the officers that the genius of the Russian army was fo attack and for forward movements, there being a very widespread impression, shared in even by those highest in command, that the enemy would not be able to withstand the Russian bayonet. This no doubt had something to do with the lack of care in the location of field works, as they were only to be depended on for rallying points and to enable an inferior force to withstand the attack of numbers. The use of hasty intrenchments was not common in the early engagements of the war, but seemed to be a matter of gradual develpment. The most conspicuous use of them which came under ur observation was in the preparation of the final attack on he Putilov, or Lone Tree Hill, on the Sha River line, on the 16th of October. A number of tentative assaults had been made by Russian regiments in the course of the day, and in he afternoon five regiments were prepared to make a decisive ssault. Two of these regiments, advancing from the north, partially covered by knolls and villages, constructed hasty intrenchments as they progressed, and especially at the point where they halted to await the orders for the final assault. These works consisted simply of trenches constructed with the field-intrenching tools carried by the men and were entirely for kneeling or lying infantry, the batteries retaining their position in which they had been placed for the preparation of the attack. It was quite early apparent that the shallow field trenches, hastily made under fire, would afford but little protection from shrapnel, and, in fact, the semi-permanent works at first constructed at Liaoyang and to the south of that place were much too open. At first there was a tendency to speak with derision of the narrow trenches found in the Japanese positions, but it was gradually recognized that this was the proper type; and after the battle of Liaoyang all Russian trenches were made deep and narrow and furnished as speedily as possible with splinter proofs so situated as to be quickly accessible as a protection from ordinary shrapnel. These blindages, so called, were covered with timber of about the size of railway ties and then with from 10 inches to a foot and a half of earth.

All field works and finally all gun emplacements were protected by trous-de-loups and wire entanglements with very narrow entrances at the gorge. This was especially the case around the position of Liaoyang. They were also protected by fougasses and mines. How effective the latter may have been we had no opportunity of judging. It is well known, however, that none of the redoubts forming the second line of defense around Liaoyang were taken by the Japanese until about to be abandoned by the Russian rearguard, and the general history of the fierce and fruitless assaults upon these works is well known.

Some idea of the difference between contract labor and that of troops may be gained from the statement that the cost of each of the larger redoubts around Liaoyang—that is, th redoubts designed for two companies of infantry and tw guns—was stated by the Russians to be 20,000 rubles. The were constructed by Chinese, superintended by engineer soldiers.

In November the two batteries on the west rib of Putilo Hill were in such a position that it was impossible to fin cover within a reasonable distance for their caissons. Henc an epaulment was thrown up on ground low enough to b out of sight of the enemy, but so flat as to be entirely expose to his unaimed fire and about 700 yards to the right and rea of the batteries. This was for the protection of the caissons, and consisted of a ditch with parapet in front of it so arranged that the teams could readily drive out to the rear at any point and yet affording complete cover to the enemy.

DISCIPLINE AND TRAINING.

On a sudden mobilization for war it is probable that the first dependence must be placed upon reserve troops rather than on the so-called active army, for the former have completed their period of training and the latter have not. It is a well-known fact that the Russian peasant is notably slow in acquiring any kind of knowledge or training, and undoubtedly the recruit drill in the Russian service must cover a longer period than in other armies. When troops are needed in an emergency, a large percentage of the active army will be found still in the recruit stage, and in order to get efficient soldiers the reserves must be called out in addition.

I have been credibly informed, although I have no way of verifying the statement, that it often happens that there is a lack of money for the proper equipment and maintenance of troops in one district or another. In such a case recruits upon responding to the call and presenting themselves at the rendezvous are given an indefinite furlough and returned to their homes subject to call, but without any training, and sometimes completing their period of service without it. However this may be, it certainly is true that in the month of November, when large numbers of men were being sent to Manchuria to fill up the depleted corps the commander in chief protested against sending him untrained recruits, on the ground that the men were needed for immediate action and that there was no time to give them elementary training. The troops in Manchuria were drilled and instructed whenever the service admitted of it, but very little instruction was possible during the rainy season, and many regiments were too constantly in contact with the enemy to admit of any sort of drill. No target practice came under our observation. I made considerable inquiry into this matter, and I could not learn that there had been much target instruction previous to the war. Almost invariably when a soldier was asked whether he had ever fired his rifle, he replied "Yes, once," which being explained was found to mean that he had fired at one time the contents of one clip, or five cartridges.

Circumstances prevented the foreign observers from seeing very much small-arm practice near enough to observe the details. In one particular case, on the morning of September 2, I was able to observe an infantry firing line abreast of me and about 800 yards distant, on the spur of a mountain. The firing was at first entirely by volleys, and the men brought their pieces to the shoulder and held them horizontally. I was informed by officers whom I knew to be careful observers that this was not invariably the case in rapid fire. It is well to note here that as the pieces were fired a light hazy smoke was visible. The result of my observations throughout the campaign, combined with that of officers who were more fortunate in their closer contact with fighting troops, suggests the idea that perhaps the chief merit of volley firing by command is that with badly instructed or excitable troops it forces the men to fire horizontally instead of in the air. Certainly there were some cases of hostile contact, where the result led to the belief that both Russians and Japanese had fired principally in the air. It was impossible to otherwise understand how there could have been so much firing with so few casualties. I am satisfied that when the complete history of this war can be collated it will furnish one of the strongest arguments for the encouragement of target practice by pointing to the ultimate expense of the neglect of it.

Whatever the Russian soldier may lack in training in various directions he certainly does not lack that discipline which exacts thorough and unreasoning obedience on the part of

the soldier. He is always most observant of the regulati
for saluting officers, and if one were to judge from that alo
the Russian army in Manchuria would be considered m
highly trained. He is most obedient to his officers and
thought of insurbordination ever enters his mind. What
essentially lacks is intelligence. The Russian army app
ently comprises very few men of the class sufficiently inte
gent to make efficient noncommissioned officers. Cert
men wear on their shoulder straps badges of corporal or s
geant, and the sergeant major, or first sergeant of a compa
is usually conspicuous for his force and habit of comma
but below him, so far as efficiency goes, there is nothing
the private. This, as a consequence, throws additio
responsibility on the officers and makes their duty m
laborious than it should be. This effect is increased en
mously by the actual stupidity of the soldier in certain dir
tions. When one asks a question of a Russian soldier,
matter how simple a question, it may be the name of the
lage or the direction of the road or the whereabouts, perha
of his regimental headquarters, he almost invariably answ
either, "I know not" or "I can not know." He can tell t
name of his regiment, which is usually the name of the to
of his nativity, but he often can not give the number of t
regiment, although he wears it on the front of his own c
The effect of this is that every time an order is given him
perform any duty it must also be explained as to just h
it is to be done. This results in a lack of conciseness, and
an observer it appears that the explanation to a soldier o
peasant of how to do a simple thing consumes an amount
time and energy entirely disproportioned to the importan
of the thing to be done.

On August 13 while bivouacked at the village of Sa
lingtzu it fell in my way to observe a general court-mart
in session for the trial of a Cossack. One of the rooms of t
etape was fitted up with a table and chairs for a court
about seven members. The table was covered with a r
cloth and behind it was hung the portrait of the Emper
These preparations apparently being a matter of regulatio
The offense was for thrice abandoning his post as a sentinel
outpost duty, and the sentence was imprisonment for eig
years in Siberia.

SUPPLY.

Rations.—The supply of the army is in the hands of the intendance department, the soldiers of which wear on the shoulder straps the letter "E." Of this department it was difficult to procure information, but it was evident that in its hands was the business of furnishing the army with rations, forage, and clothing. The handbook of the Russian army gives the components of the rations, the chief of which are tea, bread, groats, and fresh meat. During the war rations are issued to officers either in kind or by commutation. The tea of the ration is brick tea, which is a conspicuous feature of the Chinese trade. Cut loaf sugar was usually issued, and seemed to be largely purchased in the country. Fresh black bread was issued ordinarily, although each officer and soldier carried two and a half days' rations of "biscuit," which seemed to be made by breaking black bread into fragments, sweetening it and rebaking it. Bread was baked in loaves of 9 pounds each, the regular ration being 2½ pounds. Field bakeries were established at all supply depots, especially along the railroad between Harbin and Liaoyang. Each field bakery was of capacity sufficient for the supply of a division. The bread was very well made and was exceedingly nutritious and palatable, so that even without other components black bread and tea with sugar are sufficient for an emergency. Beef was issued on the hoof, the chief source of supply being the Chinese province of Mongolia. The animals were driven as regimental herds and speedily got fat on the Chinese crops. It was observable that efforts were constantly made to save interference with the crops, as far as possible, by herding the cattle on grass wherever it existed. In the level country grass was very scarce, being found only in cemeteries, which did not cover a large area. So far as my observation extended, there was rarely a day when the soldier did not have at least one good hot meal of soup and beef. An emergency ration, as such, is not contemplated in the regulations, but one was improvised by the issue to each soldier of two small cans of about 1 pound each, one of cabbage soup, and one of preserved beef. These two together made the mixture of soup and meat corresponding to the regular ration, and were entirely suitable. In addition to these two cans, each soldi carried two and a half days' rations of tea, sugar, salt. a "biscuit," or twice-baked bread, and groats. When groa and vegetables were lacking use was made of the grains of th country—chimisa or millet, and kaoliang, a variety of so ghum similar to or identical with Kafir corn. The latte while nutritious food for both animals and men, is not a palatable as the small millet.

In addition to the ration the soldier is provided with a sma quantity of tobacco, and in lieu thereof, to commutation a the rate of about 20 cents per month. The Russians, whil addicted to the cigarette habit, do not use tobacco in larg quantities and never for chewing.

The intendance department, in addition to the bakeries maintains at certain points on the lines of commutation étapes or stations where passing troops may encamp an find supplies ready for immediate issue. There is usuall one or more apartments in some building reserved for the us of officers into which they can take their own bedding an private stores. Ordinarily some sort of a café or restauran is conducted in an adjoining building by a civilian with a special permit of authority. At the larger étapes, an especially at the stations on the railway, a soup kitchen is equipped, but all of those that I saw had been prepared by the Red Cross Society and were maintained by it, so that troops, upon arrival, could be supplied with hot soup in large quantities. As the Russians depend upon tea as a beverage, at every étape, and, in fact, at every railway station from Moscow to Mukden, there is an establishment called a kipyatok (boiling water), which consists of a small shed or room with a large boiler in which a supply of hot water is kept at all times. Soldiers have always their mess tins, and when traveling by rail seem to equip themselves with teakettles so that they are always prepared to make tea, provided they can get hot water, and the Russian soldier with hot water and a supply of "biscuit" in his kit has a meal sufficient for his ordinary emergencies.

The principal characteristic of the intendance department in its handling of the ration was wastefulness, especially during the rainy season. At all stations along the railway and at the cantonments on all roads piles of stores were constantly seen exposed to the weather and without preparation of the ground to receive them, so that the lower layers were exposed to the wet. Efforts were occasionally made to provide a timber foundation for a pile of stores, but as timber was very scarce in the country this was only practicable at large railway stations. Chinese mats were used to some extent for cover, and when properly placed were effective, but no provision of canvas seemed to be made, and it was late in the summer when I saw paulins used for the first time. In the months of July and August a great accumulation of stores of various kinds was made at Liaoyang, and for their protection temporary buildings were run up, chiefly covered with matting. Just south of the town an extensive establishment of storehouses was planned and begun, the basis being a system of Decauville railway. The plan contemplated a great collection of small structures built of rustic frame covered with kaoliang stalks thickly plastered with mud. A few of these buildings were constructed sufficiently to show the general idea, but this, like so many other enterprises begun too late, was interrupted by the rapid advance of the Japanese upon Liaoyang. Upon the withdrawal of the Russians from Liaoyang the temporary storehouses with their contents were committed to the flames and a great mass of supplies was destroyed. A similar destruction took place at many other points upon the retreat of the army, and the wastage of military supplies from this and other causes must have aggregated an enormous value. The same lack of system observable in the care of stores seemed to obtain in their issue, but once in the hands of the soldiers there was no wastage of the ration, although this latter was not true of forage.

FORAGE.

As to the latter, both hay and grain from the west were provided for the animals, and considerable care was evidently exercised in their issue. When the hay became exhausted the army depended upon the local supply of millet stalks, both large and small. The grain provision was very largely supplemented by the bean cake of the country. This is the cake produced by pressing the beans for oil and is a good feed for stock when not given in too large quantities. If alternated with oats or barley it serves very well. When fed co tinually and without sufficient admixture of other food, undoubtedly produces an abnormal condition of the systen most plainly shown by sore eyes, and that the sore eyes we produced by this food was evidenced by the fact that the always got well if this were avoided. Any trouble with th eye was much aggravated by dust in the dry weather, but th soreness of the eye produced by bean cake occurred durin the wet season as well.

The country west of Harbin, extending to the Yablon mountains, is a hay field like the farm prairies of Nebraska In traveling west on the railway in December we observed a several stations, notably at Manhoy and Hurkura, great store of hay, oats, and fuel. Evidently there had been establishe a series of forage depots on the line of communication. A some points the entire plain was dotted with haystacks. A some stations great wood yards were in evidence, but thi supply was essential for the railway itself. A great amount i required not only for the locomotives, but for heating the cars as well. In a country where the ice must be cracked off the bottom of the cars at each station the consumption of fuel on troop trains must have been considerable.

FUEL.

The most important question in the supply of the army in Manchuria is that of fuel. The southern province, the greater part of the theater of war, is a country without fuel. The natives have been accustomed to using the stalks of the kaoliang, and even the roots, which are dug up and stored for winter provision. This is poor enough in itself, and utterly inadequate for the supply of an army, even for cooking purposes. So long as the coal mines of Yentai and Fushun were in the hands of the Russians the railroad was abundantly supplied with coal, and it was used to some extent by the army. As the winter approached it was necessary to transport wood and fuel from the eastern mountains and from the country west of Harbin, and its carriage must have been a severe tax upon the transportation both by rail and by wagon. At the time that I left the army, on the 1st of December, the fuel supply of the country was about exhausted, even the furniture of the Chinese houses having been called into requisition, especially at the Red Cross hospitals, and the kaoliang stalks had been gathered in great quantity and stacked up near these establishments, some of which must have had enough to last for several months; but not all of them had been thus provident, and the rapid absorption of the kaoliang in constructing winter quarters and providing fodder for stock had cleaned all the fields within reach of the army. As late as the 1st of November, while the foreign attachés were still in camp with the troops, it was necessary to send many miles to procure forage enough for their animals, and this alone, if there had been no other reason, would have forced them to withdraw to Mukden. In the city of Mukden it had been customary for many years, possibly for many decades, for the Chinese to dig and bring in coal from the neighborhood of Fushun, but upon the occupation of Manchuria by Russia the latter had taken possession of all the coal in sight at Fushun and declared it Russian property, prohibiting, under extreme penalties, the natives from interfering with it, so that the city of Mukden was deprived of at least a certain amount of fuel supply to which it had been accustomed, although there is no indication that coal had been universally or even generally used by the natives, who undoubtedly prefer kaoliang stalks and roots for ordinary purposes.

CLOTHING.

The summer uniform worn by the army consisted in the same trousers as worn in the winter, and thin cotton shirts and caps, the shirt being more a blouse than a shirt, in that it was not divided at the sides and was worn over the trousers, and extended to about the crotch. The cap was made of the same materials, though of the regulation form, and, being so light after a few days' wear, had no shape.

Every regiment arriving at the front after the 1st of June seemed to have a tint of gray for the shirt and cap different from any other, and one was able to study the effect of all shades from the yellowest of khaki to light green. The color which was most effective was a greenish gray, not very different from our olive drab, though with a little more green in the dye.

The officers at first were inclined to adhere to the white tunic in their summer uniform, but after some field experience adopted almost universally the gray shirt and cap of the men. The shoulder straps of the officers being prominent and the caps being distinct these two articles furnish all that is necessary as a distinguishing uniform, and although the officers may wear the same trousers, shirts, and boots as the men there is never any question as to their official status. The distinguishing badges worn by the soldiers are no less marked. Each man wears on his coat, overcoat, or shirt, as the case may be, shoulder straps of a distinguishing color, bearing letters for the designation of his division or special service corps large enough to be read at a considerable distance. On the front of his cap appears the number of his regiment, and under service conditions the color of the band of his cap shows the number of his regiment in its division, thus indicating to the initiated the district whence it comes.

During the summer all regiments had their winter clothing stored at some supply depot, and in the autumn, as the weather got cooler, each regiment exerted itself to procure its winter clothing. Regiments which had arrived after the warm weather had begun had their winter clothing intact and in good order, and were able to quickly make the change necessary to enable them to withstand the cold which came quite suddenly in the latter part of September. Those regiments which had been in service in spring had, to some extent, worn out their clothing, so that the winter supply must be a new issue. Pending the arrival of clothing from Russia, it was necessary to issue to the men cotton coats and quilts of Chinese manufacture. In many cases also soldiers found it necessary to wear Chinese shoes while awaiting the arrival of boots. This was the clothing complained of by the Japanese in dispatches published from time to time in the press, but there never was, as far as I could observe, any attempt at disguising Russian soldiers nor any possibility of mistaking them for Chinese. The coats issued were of gray color, and not of the blue ordinarily worn by the Chinese. It would be a dull eye that would mistake a Russian soldier for a Chinese at any distance, even in these garments. The supplies of winter clothing arrived during the months of October and November in large quantities from Russia, and their issue was speedily made. This provision included the gray regulation overcoat of blanket-like material, the sheepskin coat, to be worn under it, and a felt boot of great warmth. The sheepskin cap gave the shaggy finish to the costume so characteristic of the Asiatic from whom the Russian has derived much of his fashion in dress. It is impossible to give a comprehensive description of the winter uniform of Russian officers, for it comprised every variety of Muscovite or Asiatic costume that can be found in historical pictures. With the regiments on the fortified lines, the officers adhered to the regulation overcoat of the soldier, and were sufficiently inconspicuous, but about the railway stations, and especially among staff officers, at corps and army headquarters, the color effects were very brilliant. The regulation officers' overcoat is a light bluish gray, much more conspicous than that of the soldiers, and as officers were addicted to its use even in warm weather, which did not seem to demand so much protection, it must have been responsible for many casualties among them. The same was true, in the early part of the war, of the white coats or shirts and caps worn by both officers and men, and undoubtedly much mortality among the officers was the result of the survival of certain legends of Russian officers who had made themselves conspicuous on historic battlefields by such a costume. The death of General Keller, in a battery on the mountains east of Liaoyang, on July 31, is one case in point.

European corps arriving from Russia were very completely equipped in every way. The Seventeenth Corps brought with it to Liaoyang the warm clothing which would be needed for issue in the autumn. Upon the retreat from Liaoyang the Third Division of the corps was constrained to destroy about 220 wheeled vehicles for lack of animals to haul them. In this way was lost about 25 per cent of the clothing of the division. No doubt other organizations suffered correspondingly, as this was one of the best regulated divisions in the army.

SHELTER.

Both officers and men were often placed in cantonment in the native villages, but as the houses were ordinarily dirty and full of vermin, this was not done in good weather nor on a large scale; usually the troops were bivouacked under shelter tents. The shelter tent of the enlisted man consists of six pieces and three poles of two joints each, one piece and one section of pole being carried by each man. Troops are ordinarily bivouacked in close column and cover a surprisingly small area. The Russian soldier, however, seems able to adapt himself to conditions apparently most uncomfortable, and he is able to stand crowding better than most other people. The officers are provided with shelter tents of special pattern. Each officer's tent ordinarily used consists of six pieces of light canvas and three poles of two joints each, the capacity of these tents being from one to three persons. The pieces of canvas are about 8 feet square. The sides of the tent are double, being of two pieces each. The back is formed by folding one piece into a triangle with the two loose corners at the apex, and the front of the tent is similarly formed. These pieces of convas are not buttoned together, as with us, but are held by cords passing through eyelet holes about 8 inches apart on the edge of the canvas. The cord which holds the sides together at the ridge is so arranged as to form a support for the center pole. This tent was a very good protection from the sun, but during a hard rain the sides were too heavy, and in spite of their being double it was difficult to keep them taut and the interior dry. At regimental and other headquarters the simplicity of equipment was noticeable, and even when not reduced to shelters, the tents provided were few in number and small in size, being no larger than the common tent now in our service. Corps and division headquarters were, whenever practical, established in villages, so that paper work could be done under a tight roof. But I have seen several camps of corps headquarters in which three common tents were considered adequate provision.

At certain stations on the railway there existed barracks constructed for the military guard before the war. These were occupied mainly for hospitals and occasionally for storehouses. At the approach of winter the troops in the field were entirely housed in dugouts, constructed by cutting 5 or 6 feet down into the ground and roofing the excavations with timber and earth. This was modified wherever a hillside could be used, but by the 1st of December the entire army was virtually underground. It became the practice to destroy houses in the Chinese villages to procure the timber for the roofs, not only for these huts, but for bombproofs, and to use such brick as were obtainable for chimneys and fireplaces in the huts. This demolition was carried to such an extent that the Chinese themselves, seeing destruction of their houses inevitable, pulled them down in order to sell the material for what they could get. The houses in the villages being very useful for hospital purposes, it was necessary, in November, for the commander in chief to issue an order calculated to stop the devastation. There were numerous instances of houses being set fire to in order to quickly remove the thatched roof and expose the timbers, most of the farmhouses being so simply constructed that they had no timbers except rafters, and the thatched roof, being inflammable, could be quickly burned off, window casings and doors being saved for fuel for cooking purposes. At the railway stations long lines of sidings were laid down on which were placed trains of box cars fitted with doors and windows for use both as offices and officers' quarters, many being used by the telegraph troops. At the railway stations also were constructed enormous dugouts with carefully constructed roofs of lumber, covered with Chinese matting and finally a layer of earth, and arranged with ventilators. These were used chiefly as hospitals, but some appeared to be designed for barracks. I examined several near Mukden which measured about 65 feet in width by 175 feet in length, with the excavation about 5 feet deep, and the roofs were strongly supported and carefully made. In a climate like Manchuria, where there is but little snow and much wind, this construction is manifestly effective and, in fact, is that in use for dwellings all through Siberia and northern Asia, not only by Russians but by the natives. The most striking feature of this method of housing troops was the crowding. It was difficult to see how so many men could live in so small a house. It would be interesting to know what the medical statistics of the winter would show in the way of the diseases usually contracted by living in overcrowded and ill-ventilated rooms, for, while the Russian peasant has the reputation of being able to live and keep his health under conditions fatal to other white races, there were throughout the campaign indications of an exaggeration in this matter, and while there was no appearance of an epidemic of any kind in the army, the sick report was not remarkably small.

ARMY TRANSPORTATION.

The wheeled transportation of the Russian army is so organized as to require a great number of drivers, but it has two great merits, it has mobility and the vehicles are strong and easily repaired when damaged. The wagons and carts when empty usually move at a smart trot, so that time is economized, and when marching loaded they keep closed up in as compact a formation as the roadway will admit. In the retreat from Liaoyang to Mukden on the principal road, called on account of its directness the Mandarin road, there was always a mass of transportation, comprising all varieties of vehicle known to the army, and including batteries and artillery trains, moving steadily northward without disorder and without personal friction. This mass was always in columns moving abreast, often as many as eight, changing this formation when necessary to pass defiles, but resuming it when across.

The great mass of the wheel transportation used by the army consists of two-wheeled carts or dvoukolkas. The dvoukolka is drawn by one horse in the shafts, and wherever it is possible to acquire an extra animal this horse is reenforced by another outside the shafts and harnessed to a singletree attached to an outrigger lashed across the front of the cart and projecting 18 inches on the left side. Each dvoukolka is driven by a soldier, ordinarily a noncombatant, and is protected from the weather by a canvas cover. The vehicle is strong, not easily broken, frequently overturned with impunity, and while it has a capacity of 700 to 900 pounds of grain or other compact material, the average load is about 400 pounds. The divisional transport, and to some extent the regimental transport of European regiments, consists mainly in carts of four wheels drawn by two horses and carrying from 900 to 1,500 pounds, according to the material, and built somewhat on the lines of the dvoukolka, but with pole instead of shaft. The large wagons or trucks used for the transport of pontoon and engineer material are drawn by either three or four horses harnessed abreast. Excepting in the artillery, the Russians do not use our system of four-line teams. A special wagon is constructed for hauling the lances and other material for field telegraph lines, although this might be considered included under the term of "engineer equipment." This transportation, as well as all coming from European Russia, was furnished with large horses, but all the dvoukolkas of the Siberian or trans-Baikalian troops were supplied with the small horses of the Far East. In addition to the regular military transportation a great number of the carts of the country were in use, at first apparently hired, and later bearing the numbers of organizations and having evidently passed into the hands of the Government. The majority of these were driven by Chinese, but after August a great many were seen with soldier drivers. The Manchurian team for hauling the arba or country cart consisted of one strong animal in the shafts, whose function is to carry whatever of the load happens to be thrown upon the shafts, to guide the vehicle, and to hold it back in descending hills. In front of this one goes a team of two animals abreast with loose rope traces. The team usually comprises a set of three leaders, so as to make six animals altogether, and sometimes a seventh is added by putting a third in the swing team. This team is practical, admitting of the use of all sorts of animals, it being no uncommon thing to see oxen, horses, and mules, or even small donkeys, used in the same team. It is flexible and admits of the easy negotiation of mudholes.

The Manchurian cart consists of a long frame on two heavy wheels and carries a considerable load, the natives being skillful in so balancing the load that the wheel horse is never overburdened. This system of balanced loads is observable throughout all the native transportation and is the chief factor in their peculiar use of the pack horse. The Russian army uses pack transportation to a considerable extent, with several varieties of pack saddle of small capacity. The saddle most in use at the beginning of the war was that brought from Russia, having an iron frame fitted with hooks so as to hang on each side panniers or bags for the cargo. As late as June 1 the only pack transportation in sight comprised the pack horses of officers and the trains outfitted by the Red Cross Society for the transportation of medical supplies, but as the rainy season came on it became evident that wheel transportation could not be depended upon, and the army was directed to change its transporation from wheels to packs as speedily as practicable. For this purpose the Chinese pack saddle was adopted at once, and in every one of the towns thousands of them were manufactured for sale to the Government. The Chinese pack saddle consists of a crude wooden saddle, which is simply an amplification of the saddle used for the back strap of the cart harness, and is a pair of bars shaped like sections of a barrel, to rest on the horses back, this being rigidly joined by cantle and pommel arches of wood. To protect the horses' back a piece of ordinary felt is used and over this and under the saddle a stuffed pad of short hair. The cargo is lashed to a rigid frame, which rides on the saddle bars and between the cantle and pommel arches. The cargo is so balanced that this frame requires no fastening to the saddle and keeps the weight of the load from compressing the ribs of the animal. This cargo frame is made of hard wood bent into the shape of the letter "A" or framed into a similar shape with mortise and tenon joints. This system has the advantage that the load can be removed from the pack animal simply by two men lifting the frame out of the saddle and setting it on the ground. If the cargo be well lashed to the frame it needs no adjustment from day to day. In the native Chinese trains the pack saddle is not even supplied with girths, but only with a simple breast strap and breeching. The animals, either through training or because they are not uncomfortable, are rarely restive under the load and seem to make no effort to get rid of it. The packers are ordinarily on foot, and as the animals are small the work is easy for them, and if at any time on the march a load is spilled off or needs adjustment they have no saddle animals to care for. The speed of travel of these trains is not dependent on the packers, who are habituated to travel at any gait, but upon the size of the animals, and so far as I have been able to observe must be about 3 miles and under. Yet I think it is somewhat faster when the train is made up of small donkeys than when it is made up of the larger mules. These donkeys are very small with pipestem legs, yet their carrying capacity is astonishing, and a well-organized Chinese train is a revelation to anyone accustomed only to the American system of packing with tight girths and cinches. When the Russians first began to use the Chinese pack saddles they required girths with them, and that the load, in addition to the frame, should be lashed upon the animal or to the saddle. They gradually discovered the merit of the Chinese system and fell into it, and in the Russian pack trains observed in the autumn months there were very few girths or cinches. Observation induces the belief that the success of this system depends upon two facts, that the load is well balanced, thus avoiding the chafing from lateral motion, and that the frame keeps the load from pressing on the ribs of the animal and impeding his breathing. Certainly there is an absence of the vehement protest against the load observable in all American pack trains. I do not believe that this arises from the greater docility of the Manchurian animals, for the China pony is distinguished for his disagreeable temper.

The Chinese make considerable use of pack trains of small donkeys, and the Russian infantry on the approach of the rainy season acquired these animals in considerable number and used them to great advantage for carrying not only rations, but also the individual equipment of the officers and men, leading them with the marching troops. They worked very well, except when necessary to ford streams of some depth, when they were not tall enough to keep their loads dry, so that they were of much greater utility when used by the soldiers individually and by them assisted over the streams than when organized into trains, but as they required very little care and could subsist on whatever they picked up they were a useful adjunct to the infantry.

General Strokov, of the cavalry, devised a pack saddle which has provided an admirable means of utilizing an officer's spare horse, and this appliance or some modification of it is now used by every staff or other mounted officer in the army. It consists of a pair of wooden bars connected by steel arches at the cantle and pommel and covered by a leather lacing of sufficient height to prevent any pressure on the horse's spine. Over this saddle is thrown a pair of pockets, made either of leather or of oiled canvas, each having cubic contents of from 1½ to 2½ feet. This pair of pockets is fastened to the saddle by four straps with buckles, two at the cantle and two at the pommel. To the top of this pair of pockets are fastened three straps running fore and aft for attachment of the bedding roll, which is put on crosswise and held firmly to the pack by these three strap buckled over it. I found in practice that the strap shoul be carried under the steel arches of the saddle in order t fasten the roll rigidly to the saddle. The teakettle and th officer's individual mess kit are held one on each pocket b straps fastened to the covering flaps, and in practice the end of the bedding roll rest upon them. Articles, such as col lapsible water buckets and a small basket carrying a lanter etc., may be hung alongside the bedding roll. On the out side of the covering flaps of the pocket are straps which hol on one side a hatchet and on the other three wooden picke pins with iron points, it being supposed that the officer re quires these for his own horse, the pack horse, and the hors of his orderly or servant. The whole is covered by a squar of waterproof canvas cut to the right form, furnished wit rings in the four corners. It is fastened down by rope passed through these rings and around the horse, crossing under his girth. Of course any desired modification could be made in this equipment, and if the saddle girths are so arranged that the buckles are accessible without removing the pack it is balanced so as to ride all day without the necessity of removing it more than once for readjustment. It should be provided with a crupper and breast strap, although the Russian officers do not always use them, and in fact many horses do not require them, as the saddle has or should have double girths. This Strokov vuke, or pack saddle, was thoroughly tested in my own service, and at times with the addition of a pair of canvas pockets placed over the leather pockets and under the bedding roll for the purpose of carrying additional provisions for my servant. The maximum load was never over 80 pounds. With the Manchurian pony it was necessary to ride habitually at a trot in order to cover the ground in a reasonable time. This pack was perfectly successful at that gait and I never had a sore back produced by it.

Russian officers use under the saddle a pad of heavy felt, that of English make being the best, and I believe this to be better for the purpose than a folded blanket, though both can be used if the blanket be desired for horse cover.

TRANSMISSION OF INFORMATION.

The signal corps consisted of telegraph companies forming a component part of the engineers. In May, telegrams to Russia or other parts of the world were sent only in Russian, later in Russian or French, and after the 1st of September English messages were possible, though it was evident that the operators did not understand the language. In the field the wire followed the troops but slowly. On one occasion the removal of the headquarters of the Seventeenth Corps to a certain village about 4 miles from Liaoyang was delayed two days to admit of telegraphic connection being made between the new headquarters and Liaoyang. In this case the wires were strung on lances, but the insulated flexible wire was encountered everywhere in riding about the camps.

Telegraph lines were not kept in order, and when occasionally a lance was broken off by a wagon or the line got on the ground through broken insulators it was sure to be neglected for days, although it might be in evidence on a main thoroughfare. In many cases loose wires were allowed to hang across roads to the annoyance of all night travelers. The same carelessness was observable in the conduct of the stations.

The instruments most in use in the stations seemed to be those with ribbon record. The telephone was used to some extent, both in station and field, though not prominently. Its use was increasing when I left the army. The Siberian troops did not appear to be accustomed to the most modern methods of communication. The heliograph was in common use all over the army and semi-permanent stations were maintained in the hill country. We first saw them on the peaks overlooking the sea on the peninsula, where news of the enemy's ships was important.

In August and September we saw similar stations in the hills east of Liaoyang

The war balloons were brought from Russia in July and were first put to use in the eastern passes about the end of the month. Afterwards one of them was prominent in the vicinity of Liaoyang during the fighting of the end of August. Later on one was used extensively near Baitapu on the railway during the Sha River battles. The balloon used was spherical, with a car to hold three men. It was usually sent up to about 300 yards, though at times it looked to be 500 yards above the earth. Communication was by telephone. I never succeeded in getting a report as to its utility.

The Japanese also used balloons. It transpired that upon the outbreak of the war the Russians had a balloon in Tokyo for repairs, and they felt quite sure that the Japanese had used it and also copied it.

Messages not sent by the methods above described were carried by mounted men, and in all the time that I was with the army I saw no more than three bicycles, and those did not appear to be used by couriers.

The use of carrier pigeons was provided for, but apparently was not entirely successful. A number of pigeons existed at Port Arthur at the time the communication with that fortress was cut, and an establishment of pigeons was maintained at Haicheng and Liaoyang. A small isolated building at some distance from the railway station was reserved for this purpose. Investigation elicited the report that but few messages were received from Port Arthur and that little use was made of this means of communication.

The Russians make great use of beacons for alarm signals along the lines of communication. At every railway bridge or important culvert on the hills overlooking railway stations, at all points where a sudden incursion of an enemy is to be looked for, is placed an upright pole or scantling wrapped with straw rope and topped by a can of petroleum, so arranged as to be upset over the straw by pulling a cord. These beacons are not only used all along the front of the army and in Manchuria, but even in European Russia we found them at the railway bridges all along the line.

A system of intercommunication between organizations in action was devised several years ago at the annual maneuvers and appears to have been adopted and to have proved satisfactory. Each commander of a large organization is required to keep himself informed of the course of events in other organizations contiguous to his flanks by detailing an officer of his staff for each of the organizations on his right and left. The officer so detailed reports to the commander of the contiguous unit and remains in his suite for the purpose of transmitting to his own chief such information as he may gather.

For this purpose he has with him a squad of orderlies, and it is the duty of each commanding officer to furnish on application to such visiting staff officer the information necessary for transmittal. This system manifestly relieves each commander of the responsibility of sending information to the troops on his right and left and makes him responsible for the procurement of such information for himself. Investigation elicited the statement, which is manifestly true, that the success of this system depended very largely upon the zeal of the staff officer detailed, and it is necessary that he be selected with care.

FLAGS.

Upon joining the Russian army my attention was at once attracted to the inconspicuous use of flags and banners. The headquarters of the commander in chief was marked by a flag 4 feet by 5, made up of alternate horizontal stripes of black and orange, representing actually the ribbon of the Cross of St. George. Wagon trains and other transport connected with the chief headquarters carried this flag in a smaller form, so that while inconspicuous it was absolutely distinctive. The flag used, however, by the commander in chief in the field and which always followed him on the march and at ceremonies was a white rectangle about 4 feet by 6 bearing the legend in distinct red letters "Commander in Chief, Manchurian Army." When, during the operations on the Sha River, the foreign officers attached to the general headquarters were for various reasons separated by several miles from the cantonment of the latter their column of transport carts was furnished with the black and orange headquarters flag which gave them a ready identification and secured them always courteous treatment on the roads. The flag used at a corps headquarters is a rectangle of about 2½ by 4 feet, usually white, but sometimes of a solid color and bearing the legend of the headquarters to which it pertains. As the bivouac or cantonment of a corps headquarters is often separated into groups each group has a corresponding flag designating its character, as for example, "Seventeenth Corps, Chief of Staff," "Seventeenth Corps, Transport," "Seventeenth Corps, Intendance." The corps commander in the field is usually followed by his flag, but not always. It was not always easy to find a corps or division headquarters. In fact it was sometimes so difficult that there was the appearance of concealment. This, however, was not intentional, but was due simply to the customary disregard of conspicuous signs. The division headquarters and staff were marked by flags similar to those used by the corps and while they did not differ in appearance and size the lettering was always distinctly legible at a reasonable distance. More care was taken among the European troops to indicate the location of headquarters or of units than was observable among the Siberian troops. But even with European troops it was sometimes extremely difficult to find either a corps, division, or regiment headquarters. A flag was always displayed, usually in the corner of a mud wall when, as usual, the bivouac was in a village, but there was rarely wind enough to extend the flag, and it was still more rarely possible to get an intelligent answer to a question as to the location of the place sought. Among the European troops after being for some time in any one locality rough board signs began to appear indicating the direction to be taken to find certain elements of the command. In connection with the remark as to the concealment of headquarters it is well to observe that so much of the business was transacted by telephone after the corps or division headquarters was once established that it was not so necessary to be in a conspicuous place. At the same time the establishment of the telegraph and telephone service was neither prompt nor rapid, and one was constantly seeing officers or couriers inquiring their way and thus wasting time which could have been saved by the posting of a few signboards.

Each regiment has a color, usually a sacred picture on a white ground, heavily and elaborately embroidered and never uncovered, except for a religious ceremony. Even on occasions of ceremony, such as reviews, the color is carried furled in its case and is saluted and treated with the same respect as if uncovered. This color is carried in action but not ordinarily uncovered. No national flag is carried by the regiment. Each regiment commander uses to mark his headquarters a simple bit of bunting or cotton cloth of white or of some solid color, such as blue, green, red, or some variation of those tints harmonizing with the facings of the regiment and bearing the number of the regiment in figures about a foot high. Nothing more simple could be devised. As most of the regiments use territorial names a majority of the soldiers in a regiment were unable to answer the question as to their number, even though they wore it on the cap band and had it constantly before them in the regimental marker. To facilitate direction, dressings, etc., each battalion and each company has a flag. Those of battalions have three horizontal stripes of black, orange, and white with the number of the battalion in Roman characters on the central stripe. Those of the companies are red, blue, white, and dark green, according as the regiment is the first, second, third, or fourth of the division, and they have a vertical and a horizontal stripe forming a cross in the center. The horizontal stripe is red for the first, blue for the second, white for the third, and dark green for the fourth battalion of each regiment. The vertical stripe in red, blue, white, and dark green for the first, second, third, and fourth companies of each battalion, respectively. These flags are carried on the bayonets of the markers. The four colors just named are also utilized in the uniform to designate the number of the regiment of a division, appearing on the cap band and in the overcoat color patch. Telegraph and signal offices or stations are always indicated by a red flag bearing a black device representing crossed thunderbolts. Engineer or sapper battalions use a dark-green flag which quickly fades to black, but is always sufficiently distinct. Each infantry ammunition cart carries a small red flag, the one for high explosives being appropriately marked. An ammunition cart passing empty to the rear covers its flag. Ammunition carts at night are marked by green lanterns. A cavalry regiment carries but one standard without the national flag, this standard being always cased, as in the case of the infantry. There are also small squadron guidons marked on a similar principle to the infantry markers. Hospital and dressing stations are always marked by a combination of a Red Cross flag and the national color, the characteristic method of displaying them being side by side on a short crosspiece at the top of a mast. The indication at night is by red lanterns.

Observing captive balloons always carried the national color displayed under the car.

I never saw a flag of any kind for transmitting signals, nor did I ever hear of signaling by flag.

THE CHINESE.

During the campaign the Chinese were employed in large numbers both as laborers and as teamsters, and a great number of Chinese carts with their teams were hired by the Government, and for these services liberal payment was made. Forage and food supplies secured from the country were paid for; and upon complaint being made by the natives that this rule was not followed, the commander in chief, about November 1, issued an order calling attention to the requirement for the payment of the supplies procured from the natives, and indicating the Russian commissioner at Mukden as the authority to investigate the claims and have them paid when correct and just. A slight controversy arose at Liaoyang in August on the question of cutting the crops of unripe kaoliang in front of the fortified lines. The Russians made the proposition for the Chinese to cut the kaoliang over a certain acreage, for which they were ready to pay a reasonable amount. It was found impossible to agree upon the price, and the result was that the Russians undertook to cut the crops themselves by hired Chinese laborers, but the work was not completed at the battle of Liaoyang.

Under the conditions obtaining in Manchuria during the spring, summer, and autumn there must naturally have been cases where the complaint of the natives as to injustice or arbitrariness had validity, and there was no doubt, as I was able to learn on good authority, that the Cossacks frequently killed animals and seized forage without payment, but this was never authorized by those in high authority, and there never was a time when a strenuous effort was not made by those in authority to secure to the natives considerate and just treatment.

During the fighting on the Sha River many villages were rendered untenable, and the Chinese refugees in great numbers crowded into Mukden. In the establishment of the lines many villages had to be vacated on account of the inevitable bombardment to which they would be subjected, and their inhabitants also took refuge in Mukden. By the 1st of November the refugee population of Mukden was reported by the Chinese authorities to be 35,000, with an increment of about 800 per day. At first the Chinese endeavored to house the refugees in and about Mukden, but by the middle of November it was evident that the city had not sufficient capacity or provision for them, and the mandarins made arrangements to send them to cities farther to the north.

The Chinese are notably noncommittal and skillful in evasion, and it was never quite possible for observers, or even for the Russians themselves, to ascertain with satisfactory certainty what was the actual attitude of the Chinese during this campaign. At times their conversation in towns with certain people who had their confidence indicated that they sympathized with the Japanese, but, on the contrary, they at times strongly expressed a prejudice against them and were quite emphatic in the statement that they received better treatment from the Russians than from the Japanese and would be quite as well satisfied if the Japanese were not permitted to approach nearer. They made many complaints of the arbitrary and even oppressive measures of the Japanese, but it was impossible to tell whether these statements were made, as a matter of policy, for Russian ears or whether they reflected their actual sentiments. One thing that always obtained in the towns, but which was no indication of their sympathies one way or the other, was the fear of being left unprotected between the withdrawal of one army and the arrival of the other. They knew, by sad experience, that at such a time they would be unmercifully robbed by their own people, and it was reported on good authority in Liaoyang, and was firmly believed, not only by the Chinese but by the few foreigners resident there, that in anticipation of the withdrawal of the Russians the organized bands of Hunhuzes had made elaborate plans for the looting of the city. It was known that this banditti employed spies to collect information which would lead to the prompt discovery of valuable property.

Both Russians and Japanese employed Chinese spies in great numbers. The Japanese had the advantage of the Russians in being able to masquerade easily as natives, and occasionally the Russians arrested Japanese operating in this manner. Japanese officers, in the service of procuring information, were very daring, and on July 12 two Japanese officers were arrested by the Russians, having been overtaken by daylight in examining the fortifications in the defenses before Liaoyang. These officers, being in uniform, were treated a prisoners of war and sent west by rail in the usual way. The Russian commanders were frequently misled by their spies who, previous to making their reports, had evidently been carefully instructed by the Japanese. At Tashihchiao, for ten days before the attack was made by the Japanese, the Russian commander was kept in uncertainty by the reports of his spies, who from time to time gave him the most emphatic statements that the Japanese were about to deliver the attack, that all their arrangements were made, and that it might be expected with certainty on the next day. This was calculated to wear out the patience of the commander in chief and contribute to the fatigue and discouragement of the army. Throughout the campaign, beginning at the battle of Telissu, the complaint was common in the Russian army, and especially among the soldiers, that their screened positions were revealed to the Japanese by Chinese spies, and while it was evident that in many cases their positions were not so well screened as they imagined and were quite easily discovered by the Japanese without the use of spies, there were undoubtedly cases where the presumption was very strong that these fears were well founded. The soldiers complained that the Chinese, apparently working in the fields, actually signaled the Japanese batteries the effect of their fire and signaled an indication of the position of the Russian troops. There was at least one authenticated case in which this was true, and I have a copy of a picture made from an actual photograph of the Chinese caught in the act of signaling with a flag to the Japanese batteries.

The Russians, both officers and soldiers, are kindly individuals, and the good-tempered intercourse between them and the Chinese was very marked, especially as the Chinese with their peculiar avariciousness are not ordinarily agreeable people to deal with. With people of that character a firm authority is necessary to prevent imposition.

Scattered through the Chinese villages were many Hunhuzes, more or less armed, and it frequently happened that individual soldiers or officers passing through the country were surprised and murdered or wounded by these people. I have notes of several well-known cases, most conspicuous of which was the colonel of the Marchansky regiment, who was shot in the hand by a Chinese bandit within the lines of his own regiment about September 1. These Hunhuzes were especially numerous in the eastern mountains, where the Cossacks frequently encountered them, and in the scouting of Rennenkampf's cavalry in June and July the reports of their rifles were matters of daily occurrence. The Russians were perpetually in receipt of threats on the part of the Hunhuzes to interrupt the railway communication, and their presence in the country necessitated the guarding of this line in great strength. Occasionally reports were received of culverts blown up, but it was never possible for the foreign observers to verify them.

About September 1 we were informed that the Russian commander in chief had been officially notified by a Chinese commander named Ma, who was supposed to be near Hsinminting with a force of 20,000 Chinese soldiers, that should the Russians permit an engagement in the vicinity of Mukden, or the Imperial Tombs, he would at once attack them. Sufficient credence was given to this notification to keep a strong force between Mukden and Hsinminting prepared for the emergency described, and this threat had to be considered by the commander in chief when making his plans for the advance in October. It was stated that this threat was first written to the Russian viceroy by the Chinese Empress Dowager.

STRATEGY.

The plan of the commander in chief always, from the beginning, contemplated a probable withdrawal from Liaoyang, and the fortifications of that place in April, May, and June were on what subsequently became the second line of defense. It was calculated to hold the enemy off only so long as would be necessary to abandon the position without loss of material. It must be said in this connection, however, that at the time these fortifications were planned and constructed the power of the Japanese artillery had not yet been revealed, and it is certain that the works were considered more effective for covering the crossing of the Taitszu Rive than they eventually proved. It was a fact well known bot to the army and to the foreign observers that the commande in chief, feeling his weakness and understanding the positio better than any one else in connection with it, was oppose to the sacrifice of troops in the effort to relieve Port Arthu or in operations in the Peninsula. It was also a fact we advertised that he was forced to take this action in defianc of his better judgment, for political reasons. But whateve the cause, he did conclude to move against the enemy nort of Port Arthur, holding only sufficient reserves at Tashihchiao Haicheng, and Liaoyang to protect his line of communicatio against a possible attempt from the direction of the Yalu.

The line of the railway passing from south to north run through a hilly country as far as Kaiping, a little north o which the hills become simpler. Thereafter the road runs through a rolling country to Tashihchiao, and thence over a level plain to Haicheng and Anshantien. At the latter point are encountered considerable hills, which form the outer defenses on the south for the position of Liaoyang. The railway for the entire distance from the Peninsula to near Mukden is paralleled on the east by the broken and rugged country forming the approaches to the higher mountains of the main Manchurian ranges. These eastern hills are crossed at intervals by practicable roads over passes which admit of strong defense. Therefore the line of communication of the Russian army operating in the Peninsula was dominated by the parallel series of hills on its east. On its west lay an open country as far as the system of rivers, too deep for fording, which formed the boundary of the neutral zone.

So long as the Russians held all the passes in the eastern mountains their line of communication was safe, and the transport of troops from north to south along the railway could not be interrupted. Once these passes were in the hands of the enemy the line of communication was seriously threatened.

The movement south against the Japanese in the Peninsula began early in June. The Russians held all the passes in the mountains to the east of their line, and reenforcements were being dispatched to Haicheng and Tashihchiao as rapidly as practicable, care being taken also to reenforce the detachments covering the passes. Chief of these was the so-called Eastern Detachment, commanded by General Keller, covering the direct road from the Yalu to Liaoyang.

It was known that the Japanese were landing forces at Takushan and Pitsewo, but the magnitude of this operation was uncertain. The Japanese movements were admirably screened, and although Russian scouting parties were able to approach close to Pitsewo, and even to the coast west of Takushan, they were unable to procure much information. The commander in chief, fully conscious of the risk to his line of communication, dispatched an army corps to the south in the aggressive movement which culminated in the battle of Telissu on June 14 and 15. As soon as it was evident to the Japanese that this movement was under way they began to threaten all of the passes, with the result that a good deal of countermarching up and down the railway was induced among the Russian forces.

The First Siberian Corps was defeated at Telissu on June 15, and the troops were withdrawn up the Peninsula to Kaiping. In the last week in June the Japanese, by a practically simultaneous advance, seized all the principal passes in the eastern mountains, and from that time on they controlled the situation to a point of imposing on the Russians a wide dissemination of force and an increase in the amount of countermarching up and down the railway line. As the hills were parallel to the Russian line of communication it was impossible to change this condition unless the Russian army was completely withdrawn to the north to a point where it could be placed directly across the line of the Japanese advance. It is probable that had military reasons alone prevailed this would have been done by withdrawal at least to Mukden, if not to Tiehling.

It is necessary to remark here that the plan of the commander in chief to withdraw to the north of Liaoyang was not unalterably adhered to. There was evidence that for a time he had confidence in being able to hold the railway at least as far south as Haicheng. Liaoyang was built up into a great depot of supplies and the extension of the railway yards was on a very large scale.

At Tashihchiao the commander in chief made an address to the troops in which he told them that while circumstances had previously compelled a gradual falling back, this was t be the end of it and that thereafter there should be no givin way before the enemy.

Then in three days he fell back to Haicheng. Furthe more, the retreat from Liaoyang was not provided for b orders assigning routes to the several corps with the care tha was afterwards taken at Mukden. In the latter case it ma have been simply the result of experience, but when after th reassembly of the army at Mukden it was expected that th enemy would advance and a still further withdrawal be necessary, roads were assigned to the corps with great particularity. In this connection it is interesting to note that afte the battle of Telissu the staff attributed the failure of Stackelberg's plan to defeat the Japanese right to the fact that when the commander of reenforcements sent to the Russian left wing received an order designating his road in case of retreat, he interpreted the order to mean retreat at once and proceeded to act upon it. Probably this theory of the Russian defeat had less weight when the full history of the battle became known.

Kaiping was held as the rear-guard position, but given up when the enemy showed a disposition to attack it in force late in June. A strong stand was made at Tashihchiao with two corps, the First and Fourth, aggregating 60,000 men. The Japanese attacked on July 23 and for two days there was a great deal of artillery fire, very noisy but ineffective, with but little engagement of infantry. The commander in chief, learning that the Japanese were moving a division through the mountains to turn his left flank, was compelled to withdraw to Haicheng on July 25.

The Japanese demonstrated against the front of this Haicheng position, but it was finally rendered untenable by the defeat of the Russian left wing under General Zasulich at Tomucheng on July 31 and August 1. The army then retired to Anshantien, a position which had been strongly prepared and where it was expected to make a determined stand. This point, however, like the previous position, was dominated by the eastern mountains, and the Japanese, continuing their turning movement against the left flank of the Russians, forced them to withdraw to the outer line of defenses of Liaoyang on August 27. This line of defense had been prepared with all possible speed in the month of August and was calculated to effectively check the advance of the enemy, provided he was not in sufficient force to make an effective turning movement from the east. Up to this point the success of the Japanese in causing the Russians to withdraw from them had been so complete and continuous that they were not quite prepared for the strenuous defense that they here encountered. However, they were in sufficient force to admit of a turning movement by Kuroki, who crossed the Taitzu River at Kuantun during the night of August 30 and 31. The latter date found the Russians occupying a position covering 72 versts, or 48 miles, and thus dangerously extended, although as a matter of fact the enemy's line was still more so with a gap on the left of Kuroki. On the night of August 31 the Russian commander in chief gave orders for a contraction of his line by the abandonment of the outer line of defenses of Liaoyang, and began to withdraw the troops thus set free with the idea of overpowering Kuroki's flanking column. On September 1 the Japanese were able to occupy the outer line of defense following the withdrawal of the Russian forces. The morning of the 2d of September found Kuroki opposed by a large force extending from the Taitzu River near Liaoyang by the village of Chouchingtzu to Yentai and composed of approximately four army corps, the Tenth and Seventeenth on the east, reenforced by two regiments of the First European Corps, just arrived; Stackelberg's First Siberian Corps, which had suffered heavy losses on the preceding days, and a part of the Fifth Corps under General Orlov. The plan was for Orlov's command to be prepared to strike Kuroki from the west so soon as the latter should be engaged by Stackelberg and Bilderling from the south, and Kuroki was so far outnumbered that it seemed to the Russian army inevitable that he should be pushed away from his pontoon bridges at Kuantun. This plan miscarried by the precipitancy of Orlov, who advanced to the attack before connection had been made with the First Siberian Corps on his right, and whose troops, being just from Russia and without war experience, were thrown into confusion. Attacks were subsequently made by Stackelberg and Bilderling, but not strongly pushed, and the Japanese were not dislodged from the position at Sahutun covering their bridges. The action was continued without much determination on September 3 but Kuroki had been sufficiently checked to insure the safety of the Russian line of communication, and on September 4 began the withdrawal of the Russian army to the north. The intrenchments at Liaoyang were abandoned on the night of the 3d and the rear guard crossed the Taitzu River, so as to destroy the railway bridge, at 3 o'clock on the morning of the 4th. The Japanese did not pursue north of Yentai, but halted at Liaoyang, being themselves exhausted and in need of supply and reorganization. The Russian army was then given time to intrench itself at Mukden, to receive large reenforcements, and to make needed reorganization. The Japanese army was placed in position north of Liaoyang on a line from the Liao River near Chentanpu through Yentai to Pensihu. The line was well screened, but its position was fairly known to the Russians. This was the first time during the campaign that it was possible for the foreign observers to get an intelligible idea of the arrangement of the cavalry screen and the first time also that it had proved effectual. The Japanese, however, had such an effective intelligence service, through their skillful use of spies, that they undoubtedly possessed much information at all times of the position of the Russian forces without the necessity of sacrificing men by an active reconnoissance service.

The Russians likewise made good use of the native spies, but always with the full consciousness that their spies were unreliable. They had learned by experience that in many cases the reports given them by their spies had been concocted in the Japanese camp. At the end of September the Russian commander in chief, having completed his preparation, gave his orders for a general advance with the object and the full expectation of sweeping the Japanese back to the south and retaking Liaoyang. The following order was promulgated:

ORDER TO THE ARMIES OF THE MANCHURIAN FORCES.

No. 687.] MUKDEN, *September 19, 1904.*

Over six months ago the enemy attacked us at Port Arthur perfidiously, before the declaration of war. Since that time the Russian forces on sea and on land have accomplished many great deeds, of which our country may justly be proud, and yet the enemy is still not only uncrushed, but even bold enough in his haughtiness to continue dreaming about a full victory over us.

The armies of the Manchurian forces, unchangeably strong in spirit, were in their numbers insufficient to crush the Japanese armies put up against them.

Much time has been needed to overcome all the obstacles and to strengthen the army of operation to such a degree as to place said army in position to carry to the end the difficult but noble and glorious task with which it was charged.

This is the reason why, notwithstanding the numerous repulses of Japanese attacks on our positions at Tashihchiao, Lantzushan, as well as on our positions at Liaoyang, I thought the time was not ripe as yet for taking advantage of those successes and passing into the offensive; so my orders were to fall back.

You were abandoning the positions that had been heroically defended by you and were covered all over with Japanese corpses; you were abandoning those positions without being molested by the enemy, and, with a stern readiness for further struggle, you were falling back to the new, beforehand-prepared positions.

After five days of fighting at Liaoyang; after having inflicted on the Japanese heavy losses, having successfully repulsed attacks on the main and on all the advanced positions, you retreated toward Mukden under the hardest circumstances with Kuroki's army advancing on the flank attacking you. You were moving through impassable muds, carrying on your fighting during the day and the night, pulling out with your own hands the ordnance and carriages, leaving no ordnance in the hands of the enemy, leaving no prisoners, taking with you all the wounded, saving all trains.

My order to retreat I was issuing with deep grief in my heart, but also with a firm faith that our retreat was necessary for the purpose of conquering our enemy when the time is ripe.

Autocratic will of the Emperor has assigned for the strife with Japan troops whose strength fully guarantees our final victory.

All the difficulties of transporting these troops over 10,000 versts are being overcome self-sacrificingly by the unfailing energy and ability of the Russians from all offices, ranks, and standings, who have been detailed to this work, having for its enormous difficulty no parallel in history.

Hundreds of thousands of men, many a ten thousand horses, wagons, millions of poods of freight are being poured by an incessant railway stream from European Russia into Manchuria for the last seven months, and with the lapse of time this stream ever grows stronger, ever grows wider.

If the regiments that have arrived prove insufficient, new regiments will come; but the Emperor's firm will that we conquer the enemy shall be carried out.

Up to the present time our opponent, taking advantage of his greater numerical strength and of an enveloping arrangement of his armies, has been operating in accordance with his own will, selecting for attacking us time opportune to his purpose.

But now has arrived the time long desired and expected by the whole army—the time when we ourselves are to advance to meet the enemy. The time has come when we shall compel the Japanese to obey our will, because the Manchurian army is now sufficiently strong to assume the offensive. Nevertheless we should constantly keep in mind that in order to conquer a strong and brave enemy every individual of the army from the lowest to the highest ought to be firmly resolved that this victory shall be won without regard to the sacrifices it demands. Let the consciousness of the importance of victory for Russia permeate you, and keep in your mind especially how we are in need of that victory

in order to relieve our brethren of Port Arthur, defending heroically for seve months the fortress placed in their charge.

Our army, strong by its unanimity with the Czar and with the whole Russi has been, in all wars in which we have ever been engaged, performing great feat in defense of the throne and the country and has won a great fame among th nations.

Remember every hour that the will of the Emperor has intrusted to you th task of defending the dignity of Russia and her rights in the Far East. Remember every hour that the confidence of our Sovereign charges you with the tas of keeping up the honor and the fame of the whole Russian army.

The autocratic commander of the Russian land is, with the whole Russia praying for you and gives you his blessing for new self-sacrificing feats.

Supported by this prayer, with full consciousness of the importance of ou task, we ought to go forward without fear and with a firm resolution to fulfill ou duty to the end, without sparing our lives.

May, then, the will of God be above us all.

KUROPATKIN,
General-Adjutant, Commander in Chief.

On October 5 the reorganization of the army went into effect.

The first or eastern army, commanded by Lieutenant-General Stackelberg, comprised: First Siberian Corps, Second Siberian Corps, Third Siberian Corps, cavalry command of General Samsonov, cavalry brigade, 2 regiments of Cossacks under Colonel Gourko.

The second or western army, commanded by Lieutenant-General Bilderling, comprised: Fifth Siberian Corps (less one brigade), Sixth Siberian Corps (just arrived), Tenth Corps, Seventeenth Corps, cavalry of Grekov's brigade, (2 regiments), cavalry dragoon brigade, Fifty-first and Fifty-second regiments.

The commander in chief held the Fourth Siberian Corps, First Army Corps, and Mishchenko's cavalry as the general reserve. It constituted in fact a third army.

The plan of the commander in chief was first to move out the first and second armies against the right and left flanks of the enemy, respectively, and as their divergence from the starting point made sufficient space, to fill this in the center by the two corps held under his own command. The first army, under General Stackelberg, was designed to move directly south from the line Fuling-Impan by roads through the eastern mountain, so as to place itself across the left flank of the Japanese on the line Yangmulingtzu-Pensihu. The army was then to advance southwest, penetrating the defiles of the mountains, drive in the right wing of the enemy, and threaten its line of communication.

The second army, General Bilderling, was to advance south with its center on the railway and Mandarin road, gaining contact with the enemy, and holding fast until the movement of the first army should develop, a similar rôle being played by the third army, which was to be deployed on an east and west line facing south, aligning on the second army, and connecting by its left flank with the first army. This connection was to be facilitated by the mobile column of mounted troops under General Mishchenko, which had been operating as the screen in front of the army, and was withdrawn to the gap between the first and third armies for the purpose of linking them. On the extreme left operated a flying column, under General Rennenkampf, for the purpose of turning the right flank of the enemy, crossing the Taitzu River and operating against his line of communications.

Rennenkampf's force had been augmented by the Seventy-first Division of the Fifth Corps and by some battalions borrowed from the Second Corps, and now comprised 15 battalions, 16 sotnias, 3 field batteries, 1 mountain battery.

The movement began on October 5. Rennenkampf attacked Penishu on October 8, but was repulsed with the loss of about 2,000 men. On the same day General Stackelberg's first army was checked and found itself unable to penetrate the passes. Meanwhile the Japanese, anticipating the offensive movement of the Russians, matured their own plan of action to attack the center and right of the Russians, the third and second armies. The Japanese, appreciating the strength of the hills held by their right, held them by a retaining force, and reinforced their left and center, the commander in chief, Oyama, issuing a terse order for the forward movement. The action on the Russian right and center began October 9.

The army on that date extended generally from Shihliho to Pienniulupu, and thence to the Taitzu River south of Kaotaitzu, with Rennenkampf still threatening Penishu.

The Russian center and right, waiting for the development of Stackelberg's movement, were now so vigorously attacked by the Japanese that they were pushed back day by day un on October 15 the lines extended from Linshengpu, on t railway north of the Sha River, to Erdagu Hill, thence Fengchiapu to Pienniulupu. Rennenkampf, with his for reduced somewhat, was guarding the Kaotuling. The Six Corps and the Fifth Corps, less one brigade, were echeloned the northwest on the right flank.

The culmination of the Japanese advance was on the nig of October 15, when they occupied a position near Shahop where the hills south of the Sha River approach the river i such a way as to enfilade the valley for several miles to th east and west and command the level country to the nort for an equal distance. This point was recaptured on th night of October 16 by the Russians, and this event mark the conclusion of the battle. There was subsequently som small changes in the lines, but the two armies held them without material change through the winter and until the openin of the spring campaign in March, 1905.

The valley of the Sha River as far east as Pienniulupu i dominated by the hills on its south, with the exception of th Erdagu Hill, upon which rested the Russian center, and which is a strong position, with the summit elevated 475 feet abov the valley. East and northeast of Pienniulupu the mountains are much broken, and of about equal strength on both sides of the valley. West of Erdagu Hill there is no high ground on the north side of the Sha River, except a few mounds and ridges between Erdagu Hill and the Hun River, the country along the Mandarin road and the railway being absolutely flat. The country in the immediate vicinity of Shahopu is dominated by the Putilov Hill, before described, and by a knoll about 6,000 yards to the southwest of Putilov.

It is evident that the strength of position was in favor of the Japanese, whose right was secure in the hills and whose left was somewhat refused in the level country. Between the railway and the Liao River the Russian left was considerably refused to cover the important Kaotuling, and was very strong. Their center was in the very strong position of Erdagu Hill, heavily fortified and armed, with the Putilov Hill also heavily fortified. At the Erdagu Hill the batteries numbered 7 guns per 1,000 men. On its west, at a distance f about 4 miles, the Russian right from the Mandarin road to he Liao River, being in country absolutely flat, was not trong. The west flank of both the Russian and Japanese uld be turned by a force approaching from the neutral zone est of the Liao River.

Neither side appeared to have made an effort to fortify eavily in the flat country betwen the railway and the Liao. The opposing lines were in contact, more or less close, along e entire extent, but especially on the railway, where the llage of Linshengpu was shared by both forces with the lines ot over 300 yards apart, and at Pienniulupu, where the conact was so close that the soldiers of both armies depended on the same river for their water supply. Thus the armies ood at beginning of winter, and thus they were forced to main during the excessively cold weather in this country evoid of fuel.

Report of Capt. Carl Reichmann, Seventeenth Infantry, Observer with the Russian Forces.

Note.—Captain Reichmann left Manila, P. I., for the theater of operations on April 2, 1904, via Peking and Yinkou; arrived at the headquarters of the Russian army at Liaoyang on the 8th and reported to the commander in chief, General Kuropatkin, on the following day. During practically his entire service with the Russian army he was attached to the First Siberian Corps (General Stackelberg, commanding), and from August 8 until his return to the United States he was directly attached to General Stackelberg's headquarters. On December 1, 1904, he left the army in company with Colonel Schuyler and returned to the United States via St. Petersburg.

ATTACHÉS.

On our arrival we were furnished from headquarters with a memorandum in French, as follows:

I wish to transmit to you some of the views of the commander in chief and of the general staff regarding the position the military agents of the foreign armies should occupy in the theater of war.

We receive you in the most hospitable way possible; we bid you welcome. Study our army in all its details, the conditions surrounding our troops, criticise the warlike events from the standpoint of the general staff officer and of the representatives of military science. Captain Count Ignatiev, of the general staff, will be ready at all times to give you all information he may consider permissible.

The commander of the army places an insuperable barrier between the communications received by the representatives of the press and the information transmitted by the military agents. The world is kept informed of the warlike events by the numerous press correspondents, but minor details of the movements of troops and strength of the detachments, the character and strength of the fortified positions, escape them. All these details when communicated to the military agents as persons accredited by their Governments, as persons in whom the entire Russian army has full confidence, and transmitted by them to their countries even by mail may fall into the hands of the enemy, and thus do injury to the army that has welcomed them. Lastly, every army and every government have secrets which even in time of peace are not communicated to the entire army and are known only by a certain number of persons. I trust, therefore, that you will abstain from communicating such facts as we desire to keep secret for the time being, and that you will not touch upon them even your official reports. The military agent sees all that is of interest to him a makes notes, but he does not write the history of the war until it is over.

KHARKEVICH.

We were instructed to inclose our correspondence i addressed unsealed envelopes, and inclose them in a secon one likewise unsealed and addressed to our embassy at S Petersburg, and then to hand the papers in to the gener staff.

Bound by the above regulations, it was, of course, impracticable to make a report of any value from the seat of wa There were attachés who did make periodical reports, but i turned out that not all of them reached their destination particularly those which contained adverse criticisms.

Upon our departure to the front we were furnished with a permit from Kuropatkin's headquarters to go wherever Russian troops were, and to take photographs, but we were prohibited from going beyond the outposts or entering o photographing fortifications without special permission.

We were told that while at the front we would be subsisted at the various corps or division headquarters, and would be expected to pay for it, as well as for the forage for our animals. The experiences of the various attachés in this particular differed materially. At some headquarters they were welcome and remained so until some warlike stress occurred, when they were left to their own devices. At other headquarters the commanding general, and after a while the members of his staff also, had their meals brought to them from the general mess, probably because they did not care to have their conversation overheard by foreigners. Other attachés were thrown entirely upon their own resources for messing. As for myself, I messed at the headquarters of the Fifth Siberian Cossacks while attached to General Chirikov; subsequently I was a guest at headquarters' mess of General Stackelberg and not permitted to pay. Every Russian general has a certain money allowance for entertaining purposes, the amount depending upon his rank. General Stackelberg contributed every month 500 rubles to the mess, from which were to be paid in the first place the mess bills of the attachés at his headquarters; the balance was thrown into the mess fund. Officers, of whatever grade, coming in from the front with reports, etc., had a standing invitation to eat at the General's table. It was by no means easy for an attaché to subsist himself at the front without great expense and costly additions to his transportation, and many of the changes in assignments of attachés from one corps or division to another were requested by them on account of the kind of welcome they received, and the mess facilities offered them. The senior attachés of the various nations remained at General Kuropatkin's headquarters. The other foreign officers were assigned to the various corps and distributed to corps or division headquarters at the pleasure of the corps commander. At Kuropatkin's headquarters, as well as other headquarters, an officer was detailed to look after the attachés. Abroad it is the custom for the newly arrived officer to make the first call and within twenty-four hours of his arrival the attaché should call or leave his card on every foreign attaché that has preceded him. This prompt call is semiofficial and semisocial, is *de rigeur*, and should not be shirked. In most armies officers never appear in public without their swords, and the foreign attaché should conform to the custom; to appear without sword is to appear not fully dressed for the occasion and may be considered a lack of formality amounting to a slight.

His funds the attaché should convert into a letter of credit. Hung about his neck he should wear a flat, waterproof bag next to his inner clothing, containing his letter of credit, his passport, his orders from his home Government and his authorization papers and permits from the foreign Government and from its military authorities. He should carry as much as $500 in a wallet in his pocket for emergencies and a small amount of cash in his pocketbook for ordinary purchases. It is safe to lay in a good stock of small change and always have plenty of it with him for *pourboires*.

EQUIPMENT.

In the equipment of an attaché or military observer a thorough knowledge of the language of the army to which he is attached occupies the first place. If the attaché possesses this knowledge his usefulness is 100 per cent; if he can not communicate except through the medium of a third language his usefulness is not more than 75 per cent; if he speaks no foreign language and his own tongue is not also that of army he accompanies he is very helpless indeed, depend on the friendly assistance of other attachés, and his usefulı is not more than 10 per cent. The value of knowledge of language spoken by the army which the attaché accompaı is so great that it is strongly advised that no attaché be s to a foreign army who can not speak its language. On other hand, should we have to receive foreign attachés in c of war, it should be made a condition of their acceptance our Government that they speak English. Foreign offic that can not readily communicate their wishes are apt become discontented; they can not but feel their manif disadvantages, and may give trouble. If all attachés receive speak our language it will be easy to take care of th and to satisfy their wants and wishes.

Details of personal outfit are largely a matter of taste. the first place, an attaché should be well mounted. He has ride much and one horse is not enough for him; he should ı have less than two saddle horses. He may be attached t general who rides not less than 30 or 40 miles a day a changes his mount once or oftener per day. The attac being attached to the general, has to follow him, has to keep with him, and one horse can not stand it. Again, the gene rides light, which is by no means the case with the prope equipped attaché.

The attaché wears his saber (and pistol) and should ne go without field glass and camera. The field glass should ı be less than 12-power and his camera should be a 3-A kod or slightly larger, with a good lens for landscapes. In pockets he should have a reliable timepiece, first-aid packa compass, substantial field knife, aneroid barometer, notebo of suitable size, and pencil. His pockets can neither be t many nor too large.

In the notebooks he jots down his notes and writes them in the evening in his journal. For the latter, a book like Let Diary and Almanac No. 43 is recommended. It is a bo 8 by 10 inches, remarkably light for its size, and interleav with blotting paper; has a large, closely ruled page for ea day, and the head of each page shows the date, day of t week, and number of days in the year. In the back is a co venient arrangement for keeping money accounts. At t head of each page should be written the places of departure and arrival of the day's march, and the distance covered and the state of the weather. On some spare pages a register should be kept of all private and official letters received and sent.

The aneroid barometer gives approximate measurements of altitudes, and will indicate to some extent the weather to be expected. This instrument is not a necessity, but is of such usefulness that its use is strongly recommended. A small folding magnifying glass (vest-pocket size) is sometimes useful in map reading and copying.

The attaché will find a dispatch bag most convenient. In it he carries his maps, stationery, fountain pen, black and colored pencils, erasers, transparent case for map, and some tracing linen. He should never be without tracing linen. For emergencies, the attaché should have in his baggage a securely closed vessel for coal oil. When soaked with this medium paper becomes sufficiently transparent for copying work. In two or three hours it is sufficiently dry for use and retains its transparency for several days.

On my horse I carried a large poncho, ordnance saddlebags, and canteen and a small sheet of oilcloth to protect horse equipments from rain. In the saddlebags I carried the individual mess kit furnished by our Ordnance Department, soap, towel, and toothbrush, a chamois skin jacket, a small package of compressed tea tablets, and an ounce bottle of saccharine tablets, a few packages of condensed soup, two or three tins of salmon or corned beef, candles and matches, quinine, opium, and cathartic pills, and three spools of films for the kodak. In addition, I wore over my right shoulder a small light haversack closed by a button, in which were pipe and tobacco and a supply of hard bread. In this way I always had with me tea and sugar for a month and food for three days at a pinch. During battle and retreat I slept in my clothes with my saddle for a pillow and my poncho for a blanket, the baggage on such occasions remaining a day's march in rear and not coming up sometimes for a week.

The rest of the field baggage is carried by pack animals or on wheeled transportation. At one time I used two pack mules, at another a bukolka. With wheeled transportation one can generally carry a little more baggage and be more comfortable than with pack animals, but the latter are a far surer means of transportation in a difficult country, and therefore to be preferred at all seasons, except winter. I carried a "gold medal" cot, one blanket, one sheet, two little Philippine pillows, and a mosquito bar rolled in a sheet of canvas and tied with rope, a wooden box with meat conserves, tea and sugar, candles and matches, hot-water pot, teapot, can opener, etc. Coffee, chocolate, and condensed milk were luxuries, kept on hand only during long rests, provided they could be purchased then. (We took luncheon and dinner at the headquarters mess, but had to provide our own breakfasts.) The bukolka in addition transported my soldier's kit, my interpreter's bedding, some tools, spare rope and straps, nosebags and water buckets, horseshoes and nails, axle grease, and lantern.

Condensed soups, pea soup cartridges, and potted meats in small packages (one tin equal to one meal for one person) are most convenient things to have, but one need never expect to be able to buy them or anything real good and useful on the theater of war.

Of tools, a saddler's awl, needles and twine, assorted rivets and rivet setter, adjustable hand punch, and a set of tools (combination, tools being inclosed in handle) are indispensable, for in a large army the attaché can not count on much assistance and should be able to help himself.

The question of a tent is a mooted one. The attaché ought to have one, for he can not count on always being quartered in a house and he needs one for his orderlies and servants. Tents are bulky and heavy, and it is recommended that the attaché provide himself with two shelter tents (one for himself, one for the servants) somewhat larger than our army shelter tent and made of balloon silk. They are light, strong, and waterproof.

An extra saddle and several bits and bridles and one or two extra cinches of different sizes should form part of the officer's outfit.

The Russians have various pack devices for officers' baggage. There were numerous excellent devices in this line which if executed with American workmanship would be still stronger and better than those I saw. In our own country and in our own service I have never seen anything so useful, and I have gradually come to the conclusion that as regards equipments we are not abreast of the times. The days of desert Indian campaigning are over, when a soldier had to carry a day's supply of water on his person. The dimensions of our canteen might now be reduced without disadvantage and its material changed from tin to aluminum with several positive advantages. If the Russian and other European armies can afford to have aluminum mess kits we certainly can. I was told that my saber and tin cup were the only things in the Manchurian army that rattled and reflected the sunlight, and this statement was about true, I believe.

The bugbear of the American military attaché is his accounts. The laws and regulations governing our system of accounting take no account of the military observer with foreign armies in war. An attaché finds himself confronted with financial questions of various kinds and the Auditor for the War Department is constantly looming up on his horizon like a black cloud, and the laboriousness and elaborateness of quartermasters' vouchers and other papers give him bad dreams at night and spoil the keen enjoyment he would otherwise derive from the exercise of his functions.

Again, a military observer of low rank does not remain attached to the higher headquarters, but has to hustle with the troops in the front, and can not count on being able and should not be expected to render regular accounts.

Under the law and regulations bureau chiefs have to call for these accounts if not promptly received. When a military observer has done his full duty in a ten days' battle in Manchuria and when, while congratulating himself on having escaped with his life and the loss of only half his baggage, he opens his mail and finds in the first letter a dun from some staff department at home to account for the few hundred dollars he has expended in the preceding quarter, it makes him positively unhappy.

Again, when I came home I worked six weeks in copying all my vouchers on the proper blank forms and putting them in proper shape.

An attaché makes many expenditures chargeable to the War Department which are very small but in the end amount to a considerable sum. Rather than write out by hand two complete vouchers for, say, 25 cents (he can not carry the large and heavy blanks with him), he pays the money out of his own pocket. To charge some item on another man's bill is a penitentiary offense.

With a view of benefiting future attachés I venture the following suggestions: A general expense voucher should be prepared for attachés, covering both purchases and services, with the usual certificates, remarks, etc., and certificate for the exchange printed on it. This voucher should be printed in miniature form, say 4 by 5 inches and bound in booklets, with perforated pages and carbon duplicating arrangement. With this booklet in his pocket the officer is always prepared to take duplicate receipts for any expenditure. In the evening he can write up his vouchers just as he writes up his diary, and at the end of the month he detaches his original receipts and sends them home, leaving the duplicates in the booklets, which he retains. The proper departments at home can do the rest, and they ought to.

THE RUSSIAN ARMY IN MANCHURIA.

An inquiry into the Russian forces and their organization leaves no doubt as to the absolute unpreparedness of Russia for a war in the Far East with a power whose army was organized on modern lines. The peace organization provided the following troop units:

Infantry.—Six brigades of East Siberian Rifles of four regiments of two battalions each; three reserve Siberian infantry brigades of four battalions each.

There were also the Second Brigade of the Thirty-first Infantry Division (Tenth European Army Corps) and the Second Brigade of the Thirty-fifth Infantry Division (Seventeenth European Army Corps), each brigade having two regiments of four battalions. These two brigades had been in the Far East since the summer of 1903. There were thus in all twenty-four regiments of East Siberian Rifles of two battalions, 48 battalions; three reserve brigades of Siberian infantry of four battalions, 12 battalions; total, 60 battalions.

No account is here taken of fortress troops.

In order to increase the infantry forces the six brigades were expanded into divisions by adding to each regiment a battalion and by forming three new divisions—the Seventh, Eighth, and Ninth; the result of the expansion being thirty-six regiments of East Siberian Rifles of three battalions each; in all, 108 battalions.

The Seventh Division was formed from fortress troops of Port Arthur and Vladivostok, and consisted of four regiments of three battalions each. The additional battalions for the first six divisions and the troops for the Eighth and Ninth divisions were taken from the standing army in Russia, the vacancies thus created being filled by calling additional men to the colors. The organization of the East Siberian Rifles was completed early in 1904, and they were on the spot at the time of my arrival. These twelve regiments formed three Siberian infantry divisions, each of four regiments, or sixteen battalions, the first four regiments forming the First, regiments 5 to 8 forming the Second, and regiments 9 to 12 forming the Third Siberian Infantry Division. At the time of my arrival the First Division was complete and doing garrison duty in Kirin, Mukden, and Liaoyang, and along the railroad. The Second and Third divisions were beginning to arrive at Liaoyang.

The two European brigades numbered in all sixteen battalions.

The normal establishment (peace and war) of the East Siberian rifle battalion is 21 officers and 961 men, combatants, and 3 officers and 128 men, noncombatants, and 111 horses. There are no exact data at hand as to the actual strength of these or any other troops, and no information of that kind was furnished attachés.

In one of his dispatches in connection with the battle of the Yalu General Zasulich gives the average strength of his troops before the battle as 168 men per company of infantry. It is certain that an estimate of 800 men per battalion is rather too high than too low.

We have, then, the following infantry force:

	Battalions.	Rifles.
9 East Siberian rifle divisions (36 regiments of 3 battalions)..........	108	86,400
3 Siberian reserve infantry divisions (12 regiments of 4 battalions)...	48	38,400
2 European brigades, 4 regiments, 16 battalions......................	16	12,800
Total..	172	137,600

Of cavalry there were available:

	Regiments.	Sotnias.
Primorski Dragoons	1	
Siberian Cossack division	4	2
Transbaikal Cossacks	8	4
Amur Voisko	1½	
Railroad and frontier guards		
Ussuri Voisko	1	
Total	15½	9

The actual strength is not known, but an average of 150 sabers per sotnia has been assumed to be nearly correct; but this estimate is considered too high rather than too low. We have, then:

	Sotnias.	Sabers.
Primorski Dragoons	6	900
Siberian Cossack division, 4 regiments	24	3,600
Transbaikal Cossacks, 8 regiments	48	7,200
Amur Cossacks, 1½ regiments	9	1,350
Ussuri Cossacks, 1 regiment	6	900
2 sotnias railroad and frontier guards	2	300
Total	95	14,250

All of this cavalry was organized and on the spot by the end of May. The Siberian Cossack division arrived during the month.

Of artillery the peace organization provided:

1. The First East Siberian artillery brigade of six field and two mountain batteries.
2. The Second East Siberian artillery brigade of four field batteries.
3. The Transbaikal artillery division of two field batteries.
4. The East Siberian artillery division of three field batteries.
5. The Transbaikal Cossack horse artillery of two batteries, which on mobilization expanded into four.
6. The reserve Siberian artillery division of two field batteries, which on mobilization expanded into eight field batteries.

The necessary parks for the foregoing batteries were also provided for. There were also two brigades of field artillery of three field batteries each belonging to the second brigades the Thirty-first and Thirty-fifth Infantry divisions, and mountain horse artillery batteries of four guns each longing to the railway and frontier guards.

Upon mobilization, therefore, the following artillery be-ame available:

	Batteries.			Guns.		
	Field.	Horse.	Mountain.	Field.	Horse.	Mountain.
East Siberian artillery brigade	6	....	2	48	....	16
East Siberian artillery brigade	4	....	....	32	....	....
baikal artillery division	2	....	....	16	....	....
Siberian artillery division	3	....	....	24	....	....
baikal horse artillery	....	4	....	....	24	....
Siberian artillery division	8	....	....	64	....	....
brigades of European artillery	6	....	....	48	....	....
and frontier guards batteries	....	....	2	....	....	8
Total	29	4	4	232	24	24

Making a total of 37 batteries and 280 guns.

The field and horse artillery used the same gun, the only ference being that the field battery had 8, the horse artil-ry 6 guns. A number of the batteries were still using the old attern field gun. During the month of May much artillery rrived (new from the Putilov works and not yet marked ith the number of battery, etc.) to exchange for the old pe.

It was contemplated to give to each of the 12 divisions East Siberian, 3 Siberian) 4 batteries of 8 field guns each, all 48 batteries, while but 23 were available for the pur-se. Complete batteries were sent from the European army complete the organization, but their number I could not ertain. It will be readily seen that the Russian army ed greatly in need of artillery.

In addition there were various formations of technical ps for the fortresses of Vladivostok and Port Arthur, and railway and frontier guards. The latter, though under ministry of finance, are nevertheless to be reckoned in the ength of the army, for they are men carefully selected from charged soldiers and are really an élite soldiery. They ere organized in 4 brigades with headquarters at Bukhatu, arbin, Hontahetse, and Liaoyang, and numbered 15,000 mounted and 5,000 mounted men with 7 batteries. Their ief duty during the war was to guard the railroad and its dges and stations against the interference of the native banditti and of the enemy. Their fortified guardhouse extended all along the line of the Russo-Chinese railway A one section of the railway after the other was lost by th advance of the Japanese army, the railway guards wer always the last to withdraw, and became available to strengthen the detachments posted along the more northerly positions of the railroad or for service in the line of battle As Russian misfortune increased in the south, the enterprise against the railroad in the north became more frequent and bold; as Japanese occupation of the railroad progressed in the south, the railway guards thus freed were immediately needed in the north and it is not likely that many of them were available for field service with the army.

Exclusive of technical troops there were then available in the Far East by the end of May the following troops:

Infantry.—Nine East Siberian rifle divisions, 108 battalions, 86,400 rifles; 3 Siberian infantry divisions, 48 battalions, 38,400 rifles; 2 European brigades, 16 battalions, 12,800 rifles; 1 volunteer battalion, 1 battalion, 800 rifles; total, 173 battalions, 138,400 rifles.

Cavalry.—Ninety-five Sotnias, with 14,250 sabers, inclusive of 2 sotnias of railroad and frontier guard, mounted, 4,700 sabers; total, 18,950 sabers.

Artillery.—Twenty-nine field batteries, 232 guns; 4 horse batteries, 24 guns; 4 mountain batteries, 24 guns; total, 37 batteries and 280 guns, exclusive of what artillery may have arrived from Europe—probably not less than 20 batteries.

By stripping Siberia and the Far East of troops Russia could thus muster 13 divisions of infantry against 13 Japanese divisions and 13 Japanese reserve brigades. The normal strength of the Japanese division is generally given as 14,000 infantry, whereas 9 of the Russian divisions had a maximum of 9,200, and 4 of 12,800 men, and there was nothing to offset the 13 Japanese reserve brigades. The Japanese division had 36 guns, the Russian 32, and there was nothing to offset the 36 batteries of the 2 Japanese artillery brigades. Furthermore, the Japanese had 18 mountain batteries, while the Russians had but 4, a significant fact when one remembers that the hill trails in Manchuria are difficult for artillery at all times, and that the roads in the plain are difficult a great part of the year. The Russian fieldpiece was a powerful, modern quick firer of greater range and heavier caliber than the Japanese gun, but this superiority was more than balanced by the great numerical superiority of the Japanese guns. The Russian gun was just being issued to the army, which was not yet thoroughly familiar with it. All the old-type guns in Manchuria with their carriages, ammunition, and parks had to be exchanged for new material that had to come from Russia. Moreover, the amount of artillery on hand was wholly insufficient and had to be doubled by drawing on Russia. In cavalry alone Russia was superior, but the character of the country greatly detracted from the efficiency of the cavalry service.

These conditions confronted Kuropatkin when he took command at Liaoyang. With the forces on hand he could not hope to cope successfully with the enemy who commanded the seas and who could make a landing and establish bases and starting points for campaigns wherever he pleased. His reinforcements must come over a railway of very great length and the capacity of which was much limited by its light rail. The Japanese on the other hand were comparatively nearer their home base, and they could use the steamboat, the most efficient of all means of transportation. While Kuropatkin's reinforcements were trickling slowly from the railroad, Japan could throw in her troops by the ship load. It became from the outset a competition between a long line of communication by railroad and a short line by steamer, and if any one should have doubted the result, the course of events has certainly demonstrated the superiority of the short line with the steamboat.

There remained for Kuropatkin the alternative of falling back, not so much for the purpose of shortening his own line of communication, for a few hundred miles more or less would have made no appreciable difference. The main object of such a movement would be to lengthen the enemy's lines of communication and thus gain time for the reinforcements to arrive and for organizing the forces. There were, however, very forceful reasons why this should not be done. In the first place it would have badly damaged Russian prestige to retire at the first sign of the enemy's approach from a country it had persistently declined to evacuate. It would have left

FOURTH SIBERIAN CORPS.

[Lieutenant-General Zarubaev, commanding.]

	Battalions.	Squadrons.	Guns.
Second Division	16	....	3
Third Division	16	....	3
Total	32	....	6

VLADIVOSTOK INDEPENDENT CORPS.

[Lieutenant-General Linévich, commanding.]

	Battalions.	Squadrons.	Guns.
Second Division	12	....	32
Eighth Division	12	....	32
Cavalry	....	11	8
Total	24	11	72

EAST DETACHMENT.

[Lieutenant-General Count Keller, commanding.]

	Battalions.	Squadrons.	Guns.
Third Division	12	....	32
Sixth Division	12	....	32
Cavalry	....	12	6
Total	24	12	70

General Rennenkampf: 24 sotnias, 14 guns.

General Cherikov: Fifth and Sixth Siberian Cossacks, 12 sotnias.

General Mishchenko: 12 sotnias, 1 Cossack horse battery, 6 guns.

RECAPITULATION.

	Battalions.	Sotnias.	Batteries.	Machine-gun batteries.	Bayonets.	Sabers.	Guns.	Machine guns.
First Siberian Corps	24	20	9	1	19,200	3,000	70	8
Second Siberian Corps	28	......	10	1	22,400	......	80	8
Fourth Siberian Corps	32	......	8	......	25,600	......	64	......
First Siberian Infantry Division	16	......	......	......	12,800	......	(?)	......
East detachment	24	12	9	1	19,200	1,800	[a] 70	[b] 8
Rennenkampf	......	24	2	......	......	3,600	14	......
Siberian Cossacks	......	12	......	......	......	1,800	......	......
Mishchenko	......	12	1	......	......	1,800	6	......
Third Siberian Corps	25	1	7	......	20,000	150	56	......
Vladivostok	24	11	9	......	19,200	1,650	72	......
Railroad and frontier guards	16	(?)	7	......	15,000	4,700	8?	......
Total	189	[c] 92	62	3	153,400	18,500	440	24

[a] Lost in battle of Yalu, 23 guns; probably replaced.

[b] Lost in battle of Yalu; probably replaced.

[c] The Amur half regiment is not accounted for here. Part of it was on duty at Kuropatkin's headquarters in May, 1904.

In the foregoing table the strength of the battalion is assumed as 800 rifles, of the sotnias as 150 sabers. The field and horse artillery used the same type of gun, the field battery having 8, the horse battery 6, guns. The mountain battery had 8 guns, the machine gun battery 8 machine guns. The railway and frontier guards were armed with various guns, mostly of old type, but still sufficient for the defense of railroad bridges, etc., against bandits. Among other types the railway and frontier guards had 2 four-gun horse mountain artillery batteries, purchased some years before from Argentina. These guns were of Krupp manufacture. I photographed one of these batteries in detail. Unfortunately the films were spoiled completely while in the hands of the photographer who developed them.

To carry out Kuropatkin's Fabian policy and delay the enemy as long as possible, Liaoyang was being fortified. A circle of infantry field redoubts with splinter proofs, entanglements, and troups de loup, surrounded the city at a distance varying from 1 to 3 versts, emplacements for batteries were constructed in retired positions between the redoubts, and between the batteries and the redoubts infantry trenches were built in échelon and provided with carefully constructed approaches.

Twenty miles to the south, at Anshantien, a line of hills descends from the mountains and extends westward across the railroad and across the plain to within a few miles of the Taitzu River. This line was strongly intrenched. Twenty miles farther south, at Haicheng, a similar ridge stretched westward across the railroad and plain and was fortified. If driven in, Kuropatkin's troops could thus fall back step by step from position to position, engage the enemy under the most favorable circumstances, and detain him. Similar provisions had been made for the eastern group, but, never having been there, I am unable to state where the successive positions were.

Being threatened from the southeast by Kuroki and from the south by Oku and other Japanese troops, Kuropatkin formed his troops into three groups, the eastern group to hold back Kuroki, the southern group to hold back Oku, and a central group of reserve at Liaoyang.

Kuropatkin's position, as compared with that of the Japanese, was unfavorable. The Japanese had gained control of the sea and could select their bases anywhere along the 600 miles of coast from Vladivostok to Yinkou, the home base was at a relatively small distance, lines of communications were directly in rear of the armies, and their principal means of communication, the steamship, has already been referred to. They were operating in a friendly country; and while it may be too much to say that every Chinaman constituted himself a volunteer spy for the Japanese; they certainly furnished Kuropatkin's adversary all the information he could possibly want.

The Russian army, on the other hand, was dependent for a great part of its supplies on Russia, and these supplies had to come over 5,000 miles of single-track railroad to Harbin and then 388 miles south to Liaoyang.

From Manchuria station to the eastern frontier of Manchuria the direct line to Vladivostok passes over 800 miles of Chinese territory and from Harbin to Port Arthur over 615 miles of Chinese territory (Harbin to Mukden, 338 miles; to Liaoyang, 388 miles; to Tashihchiao, 446 miles; to Kaiping, 465 miles; to Telissu, 518 miles). The Chinese and Manchu inhabitants were never too friendly, and the attacks of bandits, sometimes under Japanese leadership, on the railroad were not infrequent. Between Tashihchiao and Manchuria station the railroad presented numerous fatal points of attack in the nature of large bridges over the water courses of the country and of switch backs, deep rock cuttings, and tunnels in the Khingan Mountains.

Though strongly guarded everywhere, this railroad was nevertheless bound to be a constant source of anxiety to General Kuropatkin. His army was posted along the Russo-Chinese Railway, whose general direction from Harbin to Port Arthur is from north to south; and as the enemy's armies were facing westward, the Russian army was compelled by the circumstances to front to a flank. The all-important line of communication was parallel to Kuropatkin's front, and on his right it had already been cut by the Japanese at Pulantien, throwing the troops on the Liaotung Peninsula on their own resources.

At Fenghuangcheng Kuroki held the all-important cross-roads. In a country of the character here involved the advantages were nearly all on the side of the offensive. The passes that have been mentioned by name in reports and dispatches are by no means the only points where the mountains could be crossed. He could choose his own line of advance; he could make his preparations and concentrations of troops under cover of the mountains which shielded him from Russian observation. The main road which leaves Fenghuangcheng to cross the Fenshui Mountains is the Mandarin or imperial road, and it led in the most decisive direction to Liaoyang and the valley of the Taitzu. Successful operations on that road would threaten and imperil the Russian left flank and the line of retreat, and for that reason it was to be expected that the Japanese would select the Mandarin road for their main advance.

In the execution of his plan Kuropatkin divided his troops into three principal groups.

The eastern group consisted of:

1. General Rennenkampf's cavalry division, which guarded the road Liaoyang-Saimachi-Kuantien. This cavalry was strengthened by the addition of an infantry regiment of the Sixth East Siberian Rifles Division.

2. The eastern detachment, under General Zasulich, which consisted of the troops previously defeated at the Yalu. Zasulich was replaced at an early date by Lieutenant-General

Count Keller. This detachment occupied the principal passe of the Mandarin road.

3. Mishchenko's cavalry brigade, which guarded the righ flank of the east detachment.

The southern group of Russian troops at Tashihchiao, Yinkou, and Kaiping faced toward Oku's army in the south. It consisted of the First Siberian Corps.

Samsonov's cavalry guarded the Liao River on the right and Simonov's cavalry scouted to the south.

The last central group at Haicheng-Liaoyang-Mukden consisted of the Second Siberian Corps, some battalions of the First Siberian Infantry Division, and the troops that were arriving from Siberia.

THE TELISSU (WAFANKOU) CAMPAIGN.

As Kuropatkin's reenforcements arrived, a step by step shifting of troops took place southward until by the end of May the Second Siberian Corps had moved from Liaoyang to Anshantien and Haicheng, which positions were in turn quitted by the First Siberian Corps, which was now concentrated in the vicinity of Tashihchiao, Yinkou, and Kaiping. And now began the campaign of Telissu, which has been severely criticised, and, I believe, rightly so.

The apparent object of this movement was to prevent or at any rate to delay the investment and siege of Port Arthur. The Russian army was posted along the railroad for 75 miles south of Liaoyang with the exception of the east detachment, which in the Fenshui Mountains confronted Kuroki, who was more than twice as strong and had badly beaten the east detachment under Zasulich once before. Kuroki held the crossings of all the important roads that run across the mountains to Haicheng, Tashihchiao, and Anshantien, and his position at Fenghuangcheng was a thorn in the Russian flesh because it threatened the Russian communications north of Liaoyang. Kuroki faced to his proper front, his communications were at right angles to it, and in case of defeat they were not endangered. Kuropatkin's army, on the other hand, formed front to a flank, the line of communications was parallel to the front, very convenient indeed to feed the army, but very sensitive to the slightest pressure from the enemy. Port Arthur is 228 miles from Liaoyang and altogether too far away from Kuropatkin to be protected by him. It was a strong fortress and might be expected to take care of itself for some time at least. There is a possibility that one of the objects of the campaign was to get an opportunity for increasing the stores of the fortress in ammunition. At the last moment when the railroad had already been damaged by the enemy a successful effort was made to send a large train loaded with ammunition into Port Arthur.

When it first became known that serious operations in the direction of Port Arthur would be undertaken the news was received with surprise among the foreign officers at Liaoyang, and they were unanimously of the opinion that this stretching of the line was so risky as to be entirely contrary to Kuropatkin's plan of remaining on the safe side and that the movement was ordered by his superiors.

A victorious campaign is of course always thankfully accepted. A victory in the Liaotung Peninsula would restore Russian morale and prestige and postpone the investment of Port Arthur from the land side.

With the Japanese army from Fenghuangcheng to Takushan, and Pitsewo fronting parallel to the railroad, a Russian movement along the railroad toward Oku was necessarily in the nature of a flank march, with the risks involved in a tactical maneuver of that kind translated to the field of strategy and correspondingly increased. The best time for a movement against Oku would have been immediately upon his landing and before he had made himself secure and been reenforced. In that case the two Russian divisions on the Kuantung Peninsula might be expected to cooperate. At that time, however, the Russian army was stunned by the defeat on the Yalu, and for some time thereafter the holding of Liaoyang gave way to all other considerations. Nor did Kuropatkin have the men necessary for the movement. It would have been necessary to withdraw for this purpose every soldier of the southern and central groups, strip the long line from Mukden to Tashihchiao of troops, and rely for its safety and that of the railroad on the eastern group, which was but half as strong as Kuroki and had been defeated by him.

Nor was Oku willing to wait until the enemy took him between two fires. On May 26 he attacked and took the fortified Russian positions on Nanshan Hill, threw Stoessel

back into the peninsula, and eliminated him forever as a fact
in field operations. Moreover, additional Japanese troo
were on the sea and soon to be landed.

At the time the Telissu campaign began the Fourt
Siberian Corps had made its appearance and Kuropatk
had eight divisions to oppose to the enemy.

Colonel Schuyler and myself decided to see this campaig
and had ourselves attached to the First Siberian Corps. W
joined General Stackelberg's headquarters at Kaiping o
June 3. At that time the southward movement had mad
such progress that on the 4th he transferred his headquarte
to some point farther south.

The Liaotung Peninsula is a country almost entirel
covered by irregular, rough hills and mountains—the countr
affords practically nothing in the way of supplies. For th
same reason roads are few and outside of those along the coas
they are poor at best, and the expedition depended for supplie
entirely on the railroad, and in the movement the troop
probably followed the same route as the railroad.

South of Wafangtien the Russian cavalry formed a crescent-shaped line of outposts across the railroad and had been in touch with the enemy for some time when we reached Telissu at 10 p. m. on June 14. We were told that on that day the Russian advance guard had been driven in from Wafangtien with a loss of 300 men, that the enemy was on hand in force, that a battle was expected next day, and that the Russian artillery position was but 3 versts in front (south). Next morning at 5 o'clock the sound of the guns awoke us.

Standing near the railroad station of Telissu and facing south one looks down a narrow valley bordered on either side by high hills running north and south. Just west of the station rose a rocky hill more than 1,000 feet high, whose crest extended 2 miles to the north and whose southern spurs abutted against the river 3½ miles below where it changes direction to the southwest. The valley was about 1 verst wide, and on the east rose a complex of green hills to an elevation of 700 feet. Three miles south of the station the green hills ended, a gray hog-backed hill, perhaps 150 feet high, stretched across their path and projected into the valley. On this hill two Russian batteries were intrenched facing south, and two more batteries were to the east of them. At the foot

of this hill the railroad and the river parted company, the river avoiding the high hill turned away to the southwest, while the railroad passed to the east of that hill in pursuit of its general southern direction. This hill closed the view from Telissu station to the southward, but to the southwest the bend of the river valley could be seen for some distance and also the hills accompanying the left bank. The hill between river and railroad and the hills visible on the left bank just referred to formed the center of the Japanese position.

Stackelberg had his own corps and in addition Glaskov's brigade of the Thirty-fifth Division, the Ninth Siberian Regiment (Tobolsk), and a 4-gun horse mountain battery of the railroad and frontier guards. This would give him a strength of 36 battalions, 11 field, 1 horse, and 1 horse mountain battery (98 guns), and 20 sotnias of mounted troops. One battalion of the corps, however, had been left somewhere in the north. Glaskov's brigade arrived late in the evening of the 14th and the Thirty-sixth East Siberian Rifle Regiment arrived at midnight, and the Tobolsk regiment did not arrive until noon on the 15th, as did the horse mountain battery. The Russians claim that they had 35 battalions and 80 guns. I have not been able to ascertain whether the three batteries of Glaskov's brigade were on hand or not. There is considerable uncertainty about the amount of cavalry. There can be no doubt that Chirikov's brigade (Fifth and Eighth) Cossacks was ordered to the front to report to Stackelberg, for the general himself was there. We camped on the night of the 14th with a detachment of the Fifth Cossacks at Telissu, and with the Eighth Cossack Regiment on the evening of the 15th at Wanchialing, 20 miles north of Telissu.

I am inclined to believe that the Eighth Cossacks never reached the field and that the maximum amount of cavalry that should be credited to Stackelberg were the two railroad and frontier guards sotnias, the Primorski Dragoons, the Fourth, Fifth, and Seventh Cossacks, or 26 sotnias.

Altogether Stackelberg would then have had 35 battalions, 13 batteries, 26 sotnias, or 28,000 infantry, 98 guns, 3,900 cavalry. This is the maximum estimate that could be put on his forces.

In one very important item Stackelberg was deficient. had no field-telegraph material, and was therefore not c nected by telegraph with the commanders of his infantry cavalry divisions. The very great importance of this f will become clear on reading the subjoined, very incompl description of the battle.

After looking over the ground Stackelberg decided attack with his left on the 15th. The hill above mention on which two batteries were intrenched, constituted his c ter. He ordered his first division, Major-General Gerngr to advance early in the morning on the Ssupingchieh-Ch chiatun road and attack the Japanese right. Glasko brigade was ordered to be on the march by 5 a. m. and co into line on the left of Gerngros. Two of the four-batterie the division were posted on the hog-back hill and intrench the other two were posted farther to the east. West of railroad a regiment of the Ninth Division intrenched in hills on the right bank of the river prolonged the line to west and Samsonov's cavalry (14 sotnias, I believe) p tected the flank in the more open ground to the west in vicinity of Hsilungkou. The remainder of the Ninth Divisi 4 battalions, was held in reserve. Where the artillery of Ninth Division was I am not prepared to state. They w probably the batteries in the valley slightly to the northw of the hog-back hill. Whether all the batteries of the Ni Division were there or whether one or more batteries were the right flank or in reserve or whether the two batteries I s in reserve belonged to Glaskov's brigade I can not t There were three or four batteries in the valley.

The Japanese army advanced on the 14th on three roa It consisted of the Third, Fourth, and Fifth divisions and artillery brigade. The normal war establishment of th troops is 36 battalions, 36 batteries, and 9 squadrons. T Third and Fourth divisions had participated in the battle Nanshan Hill on May 26, and it is not known whether losses suffered there had been made good. The Third Divisi on the right came up the valley of the Tasha River, the Fi Division in the center followed the railroad, and the Fou Division on the left marched on the Fuchou road to turn Russian right. In addition to these forces the Sixth Japan Division was put in motion from Pitsewo, where it had j aded. It arrived on the 14th and was placed in reserve. The maximum forces of the Japanese might thus have been 48 attalions, 42 batteries, and 9 squadrons.

It was Oku's intention to envelop the Russian right. The Third Division took position astride the railroad, its left rest- g on the Fuchou River, the Fifth Division prolonged the ine on the right bank of the Fuchou, occupying a line of hills, nd the Fourth Division continued its turning movement. The Sixth Division remained in reserve on the railroad.

From what I saw I judge that the artillery of the Third Division was posted near the railroad east of the hill, that the rtillery of the Fifth and Fourth Divisions were operating with heir divisions, and the Japanese artillery brigade was posted artly in the river valley and partly in the railroad valley.

At 5 a. m. General Gerngros advanced against the Japanese ght with two regiments in the fighting line and one in reserve, ade headway, and pushed the Japanese so that they had to e reenforced twice. The Second Brigade of the Thirty-fifth Division, Major-General Glaskov commanding, it will be remembered, had orders to join Gerngros and be en route by 5 a. m. This brigade had arrived late on the previous even- ng, and did not march until 7 a. m. instead of 5 a. m., as rdered. Meanwhile instructions had been issued stating on hat roads the different organizations should march in case of a retreat. These instructions found General Glaskov on his belated march to join Gerngros, and he, on their receipt, by some unaccountable way of reasoning, immediately began to retreat on the road assigned to him in these instructions. This mistake was not discovered at headquarters until 9 a. m., and a staff officer went immediately to rectify it, but Glaskov did not come into line until after 11 a. m., when Gerngros had been fought to a standstill and things were becoming critical on the Russian right and center.

About 8 a. m. Colonel Schuyler and myself rode down the valley. About 9 a. m. we were almost opposite the hill on which the intrenched Russian batteries were, and we saw these batteries silenced. The artillery fire had been uninterrupted all morning, and it seemed to us at 9 a. m. that the Japanese must have brought up an additional force of artillery or changed its position, for they began ranging with battery salvos and opened a heavy fire against the Russian batteries, which became silent in less than 15 minutes. W were subsequently told that 13 of the 16 guns on the hill we lost, and that all the artillerymen were killed, wounded, contused. No living thing was visible on the hill. An am munition wagon without horses stood solitary on the side the hill under the enemy's fire.

Having overcome the Russian artillery in the center, th Japanese guns now also opened on the Russian right, an their infantry began to attack, assisted by troops from th Fourth Division, which must have struck the Russian flank The artillery fire also swept the reverse slopes of the hills, s that the ammunition trains and kitchen wagons were ordere to the rear from under the lee of the hills, where they wer posted. The cloud of dust raised by those wagons drew th enemy's fire, whose shrapnel began to search not only th front and reverse slopes of the hills, but the bottoms behind as well. Here our guide was wounded.

In the meantime it seems that the Japanese Fourth Division, which had reached Nachialing on the previous evening, made its turning movement effective and launched three columns against the Russian right, the northernmost column striking far to the Russian rear. The presence of a strong infantry force in the neighborhood of Nachialing must have been observed by the cavalry on the previous evening, but it is stated that the report did not reach General Stackelberg until next morning, when the battle was in full swing.

When we turned to take our wounded guide to the railroad station the Russian artillery was silenced and the enemy was making progress; that we could see. He shelled the Russian right and maintained a severe artillery fire against the Russian front between the railroad and the Ssupingchieh-Chaochiatun road. Behind (north) the hogback there was also a cloud of dust which drew the enemy's fire. We felt and knew that the day was going against the Russians, and as we approached the railway station there stood four battalions in mass and two batteries, with bared heads chanting their prayers. Their devotions completed, they crossed the railroad and ascended the hill immediately west of it, one battery going high up on a spur commanding the country to the west and south; the other battery came into action near the station on a hill that commanded the valley. At 11 a. m., as the reserve was crossing the railroad, a train arrived with five companies of the Tobolsk (Ninth Siberian Infantry) regiment. They were immediately disembarked and joined the reserve.

At Telissu was the chief dressing station, whither was flowing a constant stream of wounded, and a detachment was busy digging graves in the little cemetery. All the time the enemy's fire came closer and increased in intensity.

About noon a train came from the north with the rest of the Tobolsk regiment on board. It was halted about two miles north of Telissu. At that hour the evacuation of Telissu station was under way. There were three immense trains standing there and they began to shift. The foremost train pulled up close to the train of the Tobolsk regiment, and from there on an unbroken line of cars extended back all the way to the station. At the point where the trains of the Tobolsk regiment stopped the railway runs at the foot of a steep hill, the northern continuation of the hill at Telissu; at the foot and on the slopes of the hill here small bodies of troops were visible. The Tobolsk men at once ascended the slopes and were joined by the troops already there; when half way up they began to deploy in three lines, the first one a skirmish line with intervals of three paces, the second and third being platoons and companies in closed order. The whole deployment and movement looked as though executed after our own drill regulations.

In the further course of the battle the enveloping movement of the Fourth Japanese Division gradually and strongly took effect; the remaining four battalions of the Ninth Division had to be sent out at a very early stage of the battle to come to the assistance of the regiment posted at Tafangshan, and by noon the reserve of four battalions and two batteries on the hill west of Telissu station, as well as the Tobolsk Regiment, farther north, become heavily engaged. A foreign attaché with Samsonov's cavalry told me that at 4 p. m. he, with others, endeavored to join the main body of cavalry at Hoba (about 10 miles northwest of Telissu) by way of the Lungkou River, and found that road already under Japanese infantry fire, so that the detachment was compelled to take a more northernly road. The inevitable result of the successful Japanese turning movement was the rolling up of the Russian right. Some of the Russian troops retreating due north to the west of the railroad failed to clear in time the enveloping front of the Japanese division, and lost heavily. What Samsonov did with his cavalry I do not know. He probably fell back to the north in order not to be swept away eastward At 6 p. m. his cavalry was assembled at Hoba.

At 12.30 p. m. General Stackelberg gave the order for retreat on account of his inability to stem the Japanese left and because his own left had been fought to a standstill.

An aide de camp of General Stackelberg told me that at 12.30 p. m. he was sent to the First Division with the order to retreat, that there was much confusion in rear of the Russian left, so that he could not cross the mass of troops and vehicles moving both ways, and did not find General Gerngros until after 5 p. m. It seems that this general maintained himself not without great difficulty and was forced to fall back by the dismounted fire of the Japanese force of cavalry that came in on his left rear. It is stated in some accounts that the Fourth Regiment of the East Siberian Rifles, which with four batteries was intrenched between the railroad and Gerngros's main body (nearly 3 versts), gave way soon after noon. In view of the small losses of that regiment, I am inclined to assume that that regiment was not driven off by the Japanese cannonade, but that it received Stackelberg's order to withdraw. Its withdrawal exposed Gerngros's right flank and caused him no small loss.

I have not been able to learn what the action of the Russian cavalry was. To be sure, the ground there was most unfavorable for cavalry. If any Russian cavalry was on the left, why were the Japanese cavalry permitted to come in on Gerngros's rear? As previously stated, the strength of Stackelberg's cavalry as well as its disposition and action in battle is not precisely known, but it is known that Lieutenant-General Simonov was relieved from the command of the Siberian Cossack division soon after the battle of Telissu and sent home, and the same fate overtook General Chirikov, one of the brigade commanders.

The Russian losses have been variously stated. We estimated them at the time at 5,000 men. About a week after the battle Stackelberg in an official telegram reported his loss in detail, which footed up 3,200.

It is useless to speculate what might have been the case had

Gerngros been promptly supported by the 8 battalions of the Thirty-fifth Division (and 3 batteries, if they were present, which is not certain) and made good his attack on the Japanese right. The principal fact remains that the side won which had a superiority in men and guns, and whatever may have been the strength of each opponent, so much is certain that in infantry and artillery the Russians were greatly overmatched. The chief of staff of the First Siberian Corps told me that the Russians had 80 guns in the battle. Provided all the troops had their complement of artillery with them, there would be 8 field batteries of the corps, 3 field batteries of Glaskov's brigade, Samsonov's horse battery of 6 guns; in all, 94 guns. At 1 p. m. we passed a horse mountain battery of 4 guns en route to the battlefield, making a total of 98 guns of all kinds. The Japanese had 4 divisions present, which means 24 batteries, and it is stated that in addition Oku had one of the two artillery brigades, which would bring his total artillery up to 42 batteries, or 252 guns. It is also to be noted that the batteries of the Fifth Japanese Division were mountain batteries.

The Japanese general selected the more open country to the west for his turning movement, the Fourth Division making a considerable detour to that end on the day before the battle, while Stackelberg's turning movement took place on the day of battle, and in rugged country and in cramped space, and was in consequence almost without any assistance from the artillery. In view of the broken character of the ground, the 6 mountain batteries of the Fifth Japanese Division no doubt played an important part. The fire from the great Japanese batteries was overwhelming; it simply smothered the Russian batteries. While Stackelberg's guns were standing on prominent features of the ground I saw nothing of the Japanese guns nor of the large battery near the river, though I had a good view of the ground and saw their shells burst. I did not see a single Japanese soldier in the battle; but knowing, on the other hand, the Russian penchant for the use of the bayonet, there can be no doubt that the tactics pursued by the Japanese infantry were superior to the Russian. As regards the cavalry, it is not known what the Russian cavalry on the right flank did during the battle, or whether it did everything possible to hamper the Japanese turning movement. We only know that it was at **Hoba** a 6 p.m. The Japanese cavalry, on the other hand, came on the flank and rear of the Russian turning movement and occupied a position for dismounted fire action in the very rear o Gerngros.

While greatly outnumbering the Russians in men and guns, the Japanese also used superior tactics. What they did was to the purpose, was done intelligently, and with vigor and promptness. And here we come to a characteristic of the opposing armies in which they widely differed. As compared with the mobile Japanese army, the Russian troops seemed inert and sluggish. Whenever the Japanese undertook a thing they constantly increased, never relaxed their efforts, whereas the inert Russian mass moved slowly and easily came to a standstill.

Stackelberg was sorely defeated, but unlike some other Russian generals he learned his lesson from beginning to end and he became thereafter the most formidable corps commander Kuropatkin could put into the field.

We retreated north along the railroad and reached Wanchialing station, after a 20-mile march, at 7 p. m. The battle was followed by a copious shower of an hour's duration, which cleared and cooled the air and made marching pleasant. By 5 p. m. on the 16th we reached Hsiungyocheng, where the entire transportation of the First Siberian Corps was encamped by dark.

There was much commotion in the large encampment. Some time during the night the rumor spread that the Japanese detachment was reported near. When we awoke at 1 a. m. the battalions whose camps had been near us had gone, and everywhere was the sound of transportation moving in the dark.

Presently the transportation began to move, and it was nearly 6 a. m. before the last cart had moved past us. Our own soldiers seemed struck with blind terror. It was with the greatest difficulty that we managed to have them unhitch the animals and lie down again. From 1 a. m. until daylight we mounted guard over our property and transportation lest our own or other soldiers disappear with them.

At 6 a. m., when all had gone, Colonel Schuyler and I began a weary march of 20 miles over horrible roads, and at 3.30 p. m. reached the shelter of a Chinese farm house near Kaiping, where the heads of the retreating columns began to arrive on the 19th and 20th. To reach Kaiping it was necessary to cross the river by the railway bridge, the only means of crossing the now unfordable river. There was no disorder or confusion, guards and officers were stationed at both ends of the bridge, the places of encampment it seemed had all been designated, and by 6 p. m. the immense mass of transport and the troops formed as orderly an encampment as one sees in time of peace.

Kaiping now became the center of the First Siberian Corps and the Fourth Siberian Corps, which had occupied this section of the country during the Telissu campaign, moved north to Tashihchiao and Haicheng. The Japanese army slowly followed up the Russians and occupied the vicinity of Hsiungyocheng.

During Stackelberg's retreat the Japanese troops from Fenghuangcheng and Takushan showed some activity, without, however, undertaking anything decisive, and there was an all-around feeling of relief in the Russian army when the First Siberian Corps was safely back at Kaiping and within supporting distance of the bulk of the army.

Colonel Schuyler and myself went to Liaoyang soon after our return to Kaiping, and I joined the headquarters of the First Siberian Corps at Anshantien on August 8.

In the latter part of June Oku, who now apparently had four divisions and a cavalry brigade, worked toward the northeast to establish communication with Nodzu's division, which was advancing from Siuyen on Fenshuiling, over which leads the chief road from Haicheng to Siuyen. Kuroki on the right also made a general forward movement in three columns on the Mandarin road and on side roads to the right and left of it, and one of his regiments (from the guard division) is reported as fighting with Nodzu on Fenshuiling. On June 26 Kuroki occupied the Motien Pass, on the Mandarin road 70 versts from Liaoyang, and on the next day Moduling, a short cut through the mountains 30 versts to the southwest of the Motien Pass and some 60 versts from Liaoyang. This general forward movement of the enemy caused much uneasiness and the Tenth Army Corps was thrown out eastward as soon as it arrived from Russia. On the south the Russi still held on to Kaiping, which may be called the door wh leads from the southern plains into the mountainous Li tung peninsular.

After much scouting and skirmishing the Japanese to Fenshuiling on June 27. The movement on Fenshuili threw the Russian southern group, now consisting of t First, Second, and Fourth Siberian corps, into confusion. T movement came very suddenly, when most of the troops w near Tashihchiao and Kaiping, and Kuropatkin himself w to Tomucheng to direct operations. His scouts had report the enemy there 27 battalions strong, which would be t divisions and one regiment. The heat had been oppressi and now it rained copiously for a few days at a time, so th the roads and the country were in a terrible state and t troops in a pitable condition. Nevertheless the troo marched and countermarched and eventually the moveme came to a standstill, either because the Japanese were sat fied for the time or because the bad state of the weather ma further movement impracticable.

When the pressure at this point relaxed, Kuropatkin we away to join the eastern group and left General Zarubaev the Fourth Corps, the senior officer present, in charge of t southern group, with instructions on no account to all any of his troops to be cut off from the north.

The Japanese possession of Fenshuiling was a strong thre to the left flank of the Russian southern group and, when, July 9, Oku advanced in force against Kaiping, the troo there withdrew without giving battle. On July 24 Oku a Nodzu made an advance, which resulted in the battle Tashihchiao. Zarubaev, as soon as he heard the first gun the First Siberian Corps, made a long ride to be present the The Russians, it seemed, were in superior numbers and h no great difficulty in maintaining themselves, but unfavor ble news came from Tomucheng and Zarubaev, becomi alarmed for his left and remembering his instructio ordered a general retreat on Haicheng. Accordingly Tashi chiao was evacuated July 25. This meant also the evacu tion of the port of Yinkou, which opened to the Japanese new and most convenient base with railway communicati to Tashihchiao. The Russian forces, however, did n remain at Haicheng, but fell back to the position of Anshantien, it is believed under orders of Kuropatkin, who, owing to Kuroki's progress, desired to have his troops within easy concentrating distance of Liaoyang. The southern and eastern groups were now in the southeastern angle between the railroad and the Taitzu River, and in close contact, while the Japanese front had correspondingly contracted; it extended from half way between Haicheng and Anshantien to the Yushuling and the Taitzu, a distance of 70 versts measured on the air line. A concentric movement and battle at Liaoyang were now only a question of time.

Late in August the Japanese army advanced along its entire front and the Russian troops fell back to the position assigned them near Liaoyang. The withdrawal, however, was not accomplished without severe fighting to the east and southeast of Liaoyang. The Russians acknowledge a loss on the 26th of more than 2,000 men on the east front.

It was Kuropatkin's plan not to fight in the position at Anshantien, but to withdraw all the troops to positions at Liaoyang and on August 27 the movements began. The order for the retreat had been prepared long beforehand and everything was ready.

On the afternoon of the 26th the Japanese attacked the left of the Fourth Siberian Corps, and on the 27th Oku advanced on a broad front against the Anshantien position west of the railroad, no doubt with the idea of outflanking it and thus compelling its evacuation. Early on the morning of the 27th the outpost position was evacuated, a small rear guard remaining, which had a brush with the enemy and fell back to the main position. On the arrival of the rear guard at Anshantien the troops of the First Siberian Corps began their march to the north. It had rained heavily during the preceding night and rained until 10 a. m. on the 27th. The trains and artillery labored heavily and frequently the columns came to a halt when a wagon was upset or a gun stalled. The troops marched wherever they found the best footing, generally on either side of the road. The grain was so high that the location of villages could be conjectured only by the groups of trees that are generally found near them. The western roads, on which the cavalry and the Ninth Division were retreating, were concealed from view by the kaoliang,

and with difficulty a spot or two could be detected with t
field glass where troops could be seen moving. Repo
came that the Ninth Division was almost engulfed by m
and that it was feared some of the troops had been cut
To the east of the railroad the Fourth Siberian Corps w
retreating, the Second Siberian Corps having eviden
marched one or two days before. The retreat was orde
enough; nobody was in a hurry, but the heavy roads nat
ally broke up all semblance of formation. To the south
small rear guard was still visible in our former position, a
the smoke of the burning railway bridge was visible. It w
evident that the retreat had been prepared with care.
crossroads had been provided with sign posts, and whenev
a road led off to some headquarters a twenty-foot pole h
been planted with a lantern on top and a soldier station
to direct troops, staff officers, and messengers.

Next morning about 6.30 a furious action opened a little
the south of us. The enemy had evidently discovered duri
the night that the Anshantien position was empty and h
advance guard had pressed on and was now assailing our re
guard. The artillery fire was heavy, the infantry fire, thoug
not far distant, was smothered by the kaoliang and could n
be heard at all. There was much confusion in our villa
(Liushantun). The streets were narrow and so were t
exits and two streams of baggage moved on the narrow stree
in opposite directions. General Rutkovski and Colonel v
Raben, his chief of staff, were both killed early in the actio
The empty case of a shrapnel took off Rutkovski's head an
Raben's shoulder. The death of the rear guard command
and of his chief of staff left the command for some tin
without a guiding hand and the Russians lost 400 me
We watched what we could see of the fight near tl
railroad bridge over the Shaho. When the rear guard witl
drew a number of soldiers withdrew over the Shaho bridg
which the enemy could plainly see from the position on th
hills where he had spent several hours on the preceding afte
noon. His shrapnel fire now covered the bridge and th
country to the right and left, including our position. O
proceeding to the north we were now in the low ground alon
the Shaho and the roads there defied description, because
the mud.

About 3 miles north of the Shaho railroad bridge a rocky ledge crops out of the ground and rises 75 feet over the surrounding country. At the foot is a temple, and various shrines are ensconced among the rocks. Here we remained for several hours.

Near this place a battery became literally buried in the mud, and I watched for some time 24 horses tugging at a single gun without being able to budge it an inch. The weather was bright.

To the southeast we watched a hostile column marching along the crest of a high hill and finally descending. A Russian battalion moved up the slope of a near hill, evidently to oppose them, and was caught by a Japanese battery which opened on them from the northeast. From the southwest another battery, probably one of those that had fought our rear guard that morning, also opened. The battalion now deployed rapidly and went up the hill and disappeared over the crest under the fire of the two batteries. We saw the killed and wounded fall. The Japanese battery to the northeast was soon silenced by a Russian battery. Some Japanese infantry now appeared at the foot of this hill; we had watched it as it descended from the higher hill in rear. On reaching a gully all the infantry disappeared and after a while a single man would appear, look carefully around and then walk up the hill, followed by a few men. Then the infantry would suddenly appear in open order and as suddenly disappear in the next shelter. Here was an example of careful troop leading on a minor scale on the part of the Japanese, while on the other hand the Russian battalion had stood in four big company blocks on that hillside in the open and visible for miles and catching the enemy's fire from two batteries stationed almost opposite each other. I believe I saw here illustrated one of the causes of the Russian defeat—their lack of tactical skill.

General Stackelberg sent for some infantry which was marching near by and posted them behind our hill with strict instructions to keep under cover and not show themselves. We then rode away to the north; we had reached higher ground and the roads were good. We met some small detachments of stragglers. Stackelberg spoke of them very gruffly

and kept his staff busy taking down the names of every
them. We also met the battery that had left its guns
mud. The lieutenant-colonel commanding it was an ol
with long white beard. His men were all mounted
team horses and every man had a small bundle of
Stackelberg inquired what had become of their ammu
and was told that all of it had been carried away for
carts could be found. Stackelberg then wanted to kno
the men had not carried away the rest of the ammu
instead of forage and soundly berated the lieutenant-c
who, a staff officer told me, was a brave and excellent
and whose heart was already broken by the inglorious
his guns in the mud.

LIAOYANG.[a]

Liaoyang lies in the valley of the Taitzu River wh
emerges from the hills into the southern plain. On the
(right) bank the hills approach the city within a mil
three prominent hills here were fortified with redoubts
tery emplacements, and numerous rifle trenches. The
is rapid and deep, with few fords, and in order to prov
sufficient number of crossings a number of pontoon and t
bridges (six or seven) had been constructed to suppleme
railway bridge. As the river approaches Liaoyang fro
east it begins to bend to the northwest, touches the city
and then turns due north for 3 miles, when it again chang
course to the northwest and west. The railroad, coming f
the northeast, turns due west to cross the Taitzu a mile to
north of the city and then resumes its former direction.
river and the railroad thus divide the country into four
tors. The northeast sector was hilly and had been streng
ened by three redoubts, as stated above. The northw
sector was entirely flat and one or two redoubts had been co
structed on the right bank about 3 miles northwest of Lia
yang. The southwestern sector was also entirely flat and wa
strengthened with a double line of redoubts, five in first, fo
in second line, distant from each other about 1,200 yard
The redoubts were intended for infantry and had only tw
gun emplacements, one on each flank, to flank the neighborin

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[a] Map of Manchuria.

redoubt on each side. Emplacements for batteries were constructed midway between the redoubts and several hundred yards in rear. Between the battery emplacements and the redoubts rifle trenches (standing) were constructed in echelon. The whole system of the fortifications may be compared to a star fort, with the infantry redoubts at the salients and the battery empalcements at the reentrants. As the country was flat and open, approaches had been constructed from the railway embankments to the trenches and redoubts. The country was open, yet the view was limited by groves marking Chinese cemeteries and by the numerous Chinese villages. The high crops were standing and afforded good cover for the advancing enemy. It was stated that the Russian Government proposed to the Chinese to buy their crops in order to cut them down and provide a free field of fire for 800 yards and that the Chinese demanded such exorbitant prices that the Russian army took the matter in its own hands and cut down the crops.

In the southeastern sector lies the city of Liaoyang. Within 1½ miles of the city to the south the ground loses its level character, gentle undulations begin which rise into pronounced ridges and develop into high hilly country which extends in crescent shape from the railroad on the west to the Taitzu on the east, with a radius of about 5 miles from Liaoyang as the center. In this sector four redoubts protected Liaoyang. The fortifications here were much closer to the city wall (1,000 to 1,200 yards), because of the unfavorable character of the terrain; and even in this position the redoubts were commanded by the swells of the ground to the south.

On the Russian left the Seventeenth Army Corps was on the right bank of the river from Sanwantzu to Hsikuantun; the Tenth Army Corps on the left bank rested its left on the river at Hsiaopu and occupied a range of hills as far as the Suichangyu-Mengchiafang road, general front southeast; the Third Siberian Corps (formerly East Detachment) continued the line to Wijakou on a crescent-shaped ridge facing south. The First Siberian Corps continued the line to the railroad.

Five miles southwest of the station of Liaoyang the railway passes along the western foot of Shoushan Hill, a rocky eminence rising abruptly to an elevation of 600 feet over the surrounding country, its summit crowned by an old Chinese watchtower. From this hill there stretches to the southeast a ridge for 3 miles as far as the village of Yangchiachuang, where it joins on to the general mass of hills. This ridge is crossed by four roads. Beginning from the railway the first road is the Mandarin road from Haicheng, which crosses over the ridge 1½ miles east of the railway and skirts a low round hill top, on which there were trenches, and a redoubt with splinter proofs on its reverse (north) face; east of the Mandarin road rose a steep hill with double peak 150 feet above the former. Here also a redoubt was constructed with very substantial splinter proofs; access to it was perfectly safe through a gully in the rear. Between this hill and the one next to the east the road from Hsiaoyangtzu crossed to Shoushanpu. Another road from Hsiaoyangtzu lead northeastward to Hsinlitun, and between this and the last-named road rose a steep rocky ridge with a command of several hundred feet over the country to the south. The remainder of the ridge had less command and was less strong, because it already began to merge into the general mass of hilly country. Nearly a mile in rear of the position rose a small ridge, crescent shaped; the southern horn of the crescent faced slightly southeast and commanded the road from Yangchiachuang to Nanpalichuang; the northern horn faced east and northeast. Between the horns in the crescent lies the village of Fangchiatun.

This position General Stackelberg had carefully inspected before our retreat from Anshantien, and studied it for three or four days. Shoushan Hill was fortified and a shelter had been constructed behind the watchtower, in which were telephone and telegraph instruments. In a trench on top of the hill General Stackelberg took position with his chief of staff and orderly officers and no one was allowed to show himself. Telegraphic and telephonic communications were established with Kuropatkin's headquarters and with the division commanders. In addition a relay line of orderlies had been established every 30 paces, so that written messages could promptly be sent up the steep hill; each orderly had a hole dug in which he had some protection from shrapnel. In addition to the redoubts already mentioned, the position was strengthened throughout with trenches, standing and kneeling. The formation was decaying granite and the trenches constituted a strong shelter and were constructed on the military crest, a short distance down the slope toward the enemy. Shelters had also been provided for the local reserves. For this purpose the steepest parts of the reverse slopes were selected so that projectiles could not reach them unless they had a very high angle of incidence. This precaution was excellent, for the Japanese shelled not only the position, but everything in rear of it, and at the long ranges the angle of incidence of their shrapnel was steep.

While we were on the crescent-shaped ridge near Fangchiatun, on the morning of August 29, we met General Kondratovich, who told us that the position assigned his (Ninth East Siberian Rifles) division was too extensive to hold, even if his regiments were of full strength, which they were far from being, and his position was weak (which was a fact). General Stackelberg received orders to transfer his headquarters from Shoushanpu to Fangchiatun, so as to be nearer to the Third Siberian Corps on his left. A glance at the map will show that between Stackelberg's left and Ivanov's right (Third Siberian Corps) there was a gap of open country not strongly held either by the First or Third Siberian Corps, in fact, Stackelberg's position was in the nature of a strong detached fort closed on three sides to protect the Russian right and some distance from it.

For the coming battle General Kuropatkin had issued the following order:

LIAOYANG, *August 16 (29), 1.15 a. m.*

On the 15th (28th) of August the first, second, and third armies of the enemy have occupied a front from Peikou, valley of the Tangho, to Wangpaotai, Changchiaputzu, Shako, and Tuntai.

My army will assemble in the district of Liaoyang. The extreme right flank of the army will be guarded by the detachment of Major-General Kosagovski (2 battalions, 6 sotnias, and 6 guns at Tawan and by 2 companies, 2 guns, and a half sotnia at Hsiaopeiho).

The extreme left flank will be protected on the line Pensihu-Taling-Hsingking by 4 battalions, 8 guns, and 6 sotnias.

In case of a further advance of the enemy the army will fight in the fortified position Mayetun, Tatzuying, Hsiaoyangtzu, Hsinlitun, Wijakou, Kuchiatzu, Yayuchi, Hsiaopu, Sanwantzu, Tatzupu, Hsikuantun.

I. FIGHTING GROUP.

a. Lieutenant-General Baron Stackelberg, First Siberian Corps, First East Siberian Rifles Division, First East Siberian Rifles Artillery Brigade, Ninth East Siberian Rifles Division, Ninth East Siberian Rifles Artillery Brigade, Ussuri Cavalry Brigade, First East Siberian Sapper Battalion (24 battalions, 64 guns, 6 horse guns, 8 machine guns, 10 sotnias of cavalry, 1 sapper battalion), will defend the position on the heights north of Mayetun, Tatzuying, Hsiaoyungtzu, Hsinlitun, guard the grounds on the left as far as the creek flowing from Sanchiatzu to Tassu, and maintain communication with the Third Siberian Corps.

b. Lieutenant-General Ivanov, Third Siberian Corps, Third East Siberian Rifles Division, Third East Siberian Rifles Artillery Brigade, Sixth East Siberian Rifles Division, Sixth East Siberian Rifles Artillery Brigade, First and Sixth Horse Mountain Batteries, Second Chitinski (Cossack) Cavalry, Second East Siberian Sapper Battalion (24 battalions, 64 guns, 8 horse mountain guns, 6 sotnias, 1 sapper battalion), will defend the heights north of Kuchiatzu as far as the Suichangyu-Mengchiafang road, will guard the ground on the right as far as the creek from Sanchiatzu to Tassu, and will maintain communication with the First Siberian Corps.

c. Lieutenant-General Sluchevski, Tenth Army Corps, Ninth Infantry Division, Ninth Artillery Brigade, Thirty-first Infantry Division, Thirty-first Artillery Brigade, First East Siberian Mountain Battery, First and Second East Siberian Mortar Batteries, First Orenburg Cossack Regiment, Sixth Sapper Battalion (32 battalions, 112 guns, 8 mountain guns, 12 mortars, 6 sotnias, 1 sapper battalion), will defend the line from the Suichangyu-Mengchiafang road to Hsiaopu.

d. General of Cavalry Baron Bilderling, Seventeenth Army Corps, Third Infantry Division, Third Artillery Brigade, Thirty-fifth Infantry Division, Thirty-fifth Artillery Brigade, Two hundred and eighty-second Infantry Regiment, Sixth Battery Twenty-eighth Artillery Brigade, Second Independent Cavalry Brigade (Fifty-first and Fifty-second Dragoons), Ussuri Cossack Regiment, Terek-Kuban Cossack Regiment, Fourth Trans-Baikal Cossack Horse Artillery Battalion, Seventeenth Sapper Battalion (36 battalions, 120 guns, 6 horse guns, 23 sotnias, 1 sapper battalion), will cover the left flank and defend the position on the right bank of the Taitzu, will observe the river above Hsikuantun, and maintain communication with the detachment at Pensihu.

II. GENERAL RESERVE.

a. Lieutenant-General Zarubaev, Fourth Siberian Corps, Second Siberian Reserve Division, First Siberian Artillery Brigade, Third Siberian Reserve Division, Second Werchneudinski Cossacks, Fourth East Siberian Sapper Battalion (28 battalions, 32 guns, 6 sotnias, 1 sapper battalion), will take position at the villages of Hsituchiaotzu and Siuchiatun.

b. Lieutenant-General Zasulich, Second Siberian Corps, Fifth East Siberian Rifles Division, Fifth East Siberian Rifles Artillery Brigade, Second Brigade Seventy-first Infantry Division (Two hundred and eighty-third and Two hundred and eighty-fourth Regiments), Seventh and Eighth Batteries Twenty-eighth Artillery Brigade, Seventh Siberian Cossacks (2 sotnias), Third East Siberian Sapper Battalion (20 battalions, 48 guns, 8 machine guns, 2 sotnias, 1 sapper battalion), will also take position at the villages of Hsituchiaotzu and Siuchiatun.

c. Lieutenant-General Dembovski, Fifth Siberian Corps, Fifty-fourth Infantry Division, Twenty-sixth Artillery Brigade, Seventy-first Infantry Division, Twenty-eighth Artillery Brigade, Fifth East Siberian Sapper Battalion (24 battalions, 80 guns, 1 sapper battalion), will post a detachment north of the village of Chuao, the rest of the corps will take post on the right bank of the Taitzu.

d. Major-General Samsonov, Ural Cossack Brigade, Siberian Cossack Division Grekow), Second Brigade Orenburg Cossack Division, First Argunski, Third Trans-Baikal Cossack Horse Artillery Battery, Tenth Horse Artillery Division, Eleventh and Twentieth Batteries) (48 sotnias, 18 guns), will take post east of the village of Yangchialingtzu in rear of the lines of forts.

III. PROTECTION OF THE FLANKS.

I confide the protection of the left flank to General of Cavalry Baron Bilderling.

The right flank to—

a. Major-General Mishchenko, Trans-Baikal Cossack Brigade (11 sotnias, 6 guns). He will stand ready at the village of Wuluntai to protect the right flank of the army westward from the railroad to the Taitzu River on the line Hsinglungtai–Dawan and maintain communication with the detachment at Hsiaopeiho.

b. Major-General Grekov, Orenburg Cossack Division, First Orenburg Cossack Brigade (12 sotnias). He will cover the right flank of the army on the right bank of the Taitzu.

IV. The artillery of position will be posted as directed by the inspector-general of artillery.

V. The line of forts west of the railroad as far as the right bank of the Taitzu River and Fort No. 8 will be occupied by the Irkutsk regiment under the direction of Major-General Maslov, commanding the fortified rayon of Liaoyang.

VI. The chief dressing station will be at the Liaoyang railway station.

VII. The flying artillery park brigades will be echeloned in each corps by the corps commander conformably to the special instructions governing them.

VIII. The trains will be parked along the roads assigned to the corps. Their protection will be regulated by corps commanders.

IX. Reports will first be sent to headquarters at Liaoyang which will be connected with the stations of corps commanders by telegraph and telephone. Corps commanders will cause this connection to be made. Each army corps will furnish two orderly officers to the chief of staff of the army.

X. Corps commanders will designate the roads by which the troops are to march into their positions. These roads will be improved, provided with signposts, and made known to the troops.

XI. Lieutenant-General Sakharov and General of Cavalry Baron Bilderling will act as my deputies.

XII. The positions will be occupied under the direction of the corps commanders.

Recapitulation.

	Battalions.	Artillery guns.						Sotnias.	Sapper battalions.
		Field.	Horse.	Mountain.	Mortar.	Machine.	Total.		
Kosagovski:									
(Right flank)	2	6	....	....	....	....	6	6	......
Left flank	4	8	....	....	....	....	8	6	......
First Siberian Corps	24	64	6	....	....	8	78	10	1
Third Siberian Corps	24	64	....	8	....	....	72	6	1
Tenth Army Corps	32	112	....	8	12	....	132	6	1
Seventeenth Army Corps	36	120	6	....	....	....	126	23	1
	122	374	12	16	12	8	422	57	4
Fourth Siberian Corps	28	32	....	....	....	....	32	6	1
Second Siberian Corps	20	48	....	....	....	8	56	2	1
Fifth Siberian Corps	24	80	....	....	....	....	80	......	1
Samsonov	......	......	18	....	....	....	18	48	......
	72	160	18	....	....	8	186	56	3
Mishchenko	......	......	6	....	....	....	6	11	......
Grekov	......	......	....	....	....	....	......	12	......
	194	534	36	16	12	16	614	136	7

NOTE.—The normal organization of the seven corps here enumerated includes altogether 188 battalions. It may be assumed that the forces for the protection of the right and left flanks should not be included in the addition, which would leave a total of 188 battalions, 600 guns (including 16 machine guns), and 124 squadrons.

Pursuant to these instructions, General Stackelberg posted his First Division (General Gerngros) on the right, the Ninth Division (General Kondratovich) on the left, as follows:

First East Siberian Regiment occupied Shoushan Hill.

Second East Siberian Regiment in reserve in rear of Shoushan.

Third East Siberian Regiment to the east of the Mandarin road.

Fourth East Siberian Regiment west and southern part of Shoushan Hill.

The Thirty-fourth East Siberian Regiment prolonged the line on the ridge to the left of the Third East Siberian Rifle Regiment. The Thirty-fifth was in reserve. The Thirty-third held the crescent ridge at Fangchiatun. The Thirty-sixth was in general reserve.

The artillery was divided into groups of two batteries. The horse artillery battery, subsequently reenforced by another horse battery, was posted facing west about 300 yards east of the railroad at the foot of the northern spur of Shoushan Hill; two batteries were posted at the southeastern foot of Shoushan Hill, west of the Mandarin road and in rear of the low round hill, with redoubt. Two batteries were posted in the first gap and another two batteries in the second gap east of the Mandarin road, and two batteries were posted on the column between the two horns of the crescent-shaped ridge of Fangchiatun.

The two-horse batteries were standing on the level ground without any artificial cover; the two batteries at the southeastern foot of Shoushan Hill had kneeling shelter provided on the right and left of each piece, and the battery on the right (west) had dug a second line of these small shelters at right angles to the first line and passing through its center. This arrangement enabled the battery to change front to the west, which was done once or twice during the battle. The batteries in the two gaps were behind the crest, the western batteries firing to the southeast, the eastern battery to the southwest, crossing their fire in the gap. The guns on the crescent hill could fire east, south, and west; the emplacements prepared there faced east and were more substantial than any of the others; in order to fire to the south these batteries had to go slightly up the slope of the northern horn of the crescent. So far as I know these batteries received very little of the enemy's artillery fire.

August 30 we were up at 4 a. m. and rode with General Stackelberg to the bivouac of the reserve. A heavy infantry fire was crackling along the front of the Third and Thirty-fourth regiments, where the Japanese had attacked. This fire died out at daylight. We then ascended Shoushan Hill, arriving at the top at 7 a. m. The artillery fire had opened at daylight along the entire front. The morning was rather dark at first; from 8 to 12 rain and sunshine alternated; the afternoon was bright; toward evening it began to drizzle, and at 7 p. m. it began to rain hard. We were not allowed to join General Stackelberg's staff near the old watch tower and had to take post on a lower peak 150 yards east of the tower.

The enemy opposite the First Siberian Corps distributed his fire uniformly over the position, the two redoubts and our hill getting a generous share of it, and soon we could distinguish the enemy's efforts to find and silence the Russian guns. The horse battery east of the railroad fired all day to the west and southwest and seemed to be a thorn in the flesh of the enemy's turning movement west of the railroad, for the Japanese artillery fired at it from the west, it fired at it from th south clear over our hill, and it fired at it from the heights t the southeast. Once the horse battery was reached by th enemy and suffered small loss, but a change of position o 100 yards was sufficient to protect it from further damag It was now reenforced by a new battery and never slackene its fire on this day nor on August 31.

The two batteries of the southeastern front of Shousha Hill stood serenely in the open and seemed to suffer hardl any losses. The officers walked up and down behind thei guns, and when not engaged in handling the guns the me crouched in their small trenches. A colonel of artillery wa posted some distance up the slope of Shoushan Hill with a telescope and a megaphone and directed the fire of the tw batteries.

The right battery, in the first gap east of the Mandarin road was found by the Japanese guns posted on the hills, apparently at the crossroads, about 1½ miles south of the village of Yangchiachuang, and suffered severely from shrapnel and high-explosive shells, but was never silenced. The other batteries in the gaps were also hit, but did not suffer as much as the right battery. So far as I could see the two batteries on the cresent hill received no artillery fire that day, being probably beyond the range of the Japanese guns, and they received only a moderate amount of artillery fire next afternoon (August 31). I estimated the Japanese guns south of Yangchiachuang at three batteries, one on a high shoulder east of the road, and the other two batteries apparently in the fork of the road and somewhat lower. These three batteries were subjected to a steady fire of the Russian guns. They made one slight change of position and several times ceased firing. All other Japanese batteries to the west of these three batteries were met by an accurate fire from the Russian guns, became temporarily silent, and changed positions.

In the first part of the morning a Japanese column became visible on and west of the Mandarin road, was immediately taken under fire, and disappeared. Several Japanese batteries opened fire from the edge of a grain field east of the village of Tataitzu. They were taken under fire by the two Russian batteries at the southeast foot of Shoushan, and after about twenty minutes they took position, as it seemed to me, between Tataitzu and Panchiatun. The Japanese guns in their new positions were reenforced and opened a steady fire on the two opposing Russian batteries. In the afternoon several Japanese batteries assisted from a position west of the railroad and west of the village of Hsiwangchuang. Several Japanese batteries could be seen between the railway and the Mandarin road, apparently in reserve or awaiting orders, for they did not open fire that day.

While this fire, more or less desultory, was going on all day, movements of the enemy could be seen to our west, but owing to the high crops nothing definite could be made out except that more troops were visible later in the afternoon and that they seemed to move southward. I understand that Oku was making a strong turning movement that day west of the railroad, which was defeated by the Russian reserves, whom we saw move out to the west.

The villages of Kuchiatzu and Mayetun were fortified and connected by a line of trenches. Near Mayetun a fortified guardhouse of the railroad and frontier guard stands just east of the track. A hundred yards west of the railroad began standing trenches, which ran northwest for about 50 yards and then turned northeast toward the village of Kuchiatzu. At 11.30 a. m. some Japanese infantry emerged from the village 600 yards southwest of the trench and deployed as skirmishers parallel to the road leading to the railroad and frontier guard guardhouse. They had just completed their deployment when a volley came from the Russian trench, cutting half of them down. The survivors threw themselves on the ground, and a few moments later partof them ran back into the village. The other half crossed a water hole eastward, laid down in a bean field, and opened fire. Both of the parties of the enemy received reenforcements, which came by squads of about 10 or 12 men in open order. At 11.45 a. m. the Russian right battery in front of Shoushan Hill changed front and fired on the Japanese in the fields and village for about ten minutes. From the village the Japanese could be seen advancing northward, marching by the flank in extended order, keeping a high kaoliang field between the Russian trench and themselves. When they thought they had reached the flank of the trench they faced east and advanced toward the trench and disappeared in the intervening kaoliang field. After awhile a half dozen scouts emerged on our side of the field and carefully crept toward the flank of the trench and learned, probably, that the trench turned north and that they were still in front of it. Perhaps 75 yards farther north a squad or two appeared on our side of the field for a moment and disappeared again, having also probably learned that they had not yet reached the end of the trench. Now all disappeared in the crops and maintained a heavy skirmish fire, to which the Russians in the trench answered with an occasional volley. The Japanese fire gradually slackened; occasionally a man went to the rear and then a few would come to the front, probably with ammunition, and then the fire would become stronger. Occasionally we saw a Russian squad leave Mayetun and enter the trench as reenforcements, taking in each case with them some cases of ammunition. Three or four soldiers also were busy carrying ammunition from Mayetun to the end of the trench, less than 100 yards away. In the rear of the trench there gradually formed a gray line of empty ammunition cases, which are of zinc. Here the infantry fire never ceased from 11.30 a. m. August 30 until early morning September 1, when the Russian troops were withdrawn.

Toward evening it began to rain again. A Japanese battalion marched into the village from the west. A mounted officer came out of the village, received a volley, and got back into the village evidently unhurt. The Japanese fire now again became violent and slackened toward dark.

Our own position became frequently the target of the Japanese artillery. The old watchtower seemed to challenge the skill of their gunners, for they hit it frequently. It was not a hard guess for the Japanese to infer that the battle would be directed from this point, and they probably could see the messengers and orderly officers coming up the last hundred feet and disappear behind the watchtower.

August 31 we were up early and on top of Shoushan Hill by 6.15 a. m. It was to be expected that, having more or less reconnoitered the Russian position during yesterday, the Japanese had formed their plans and would launch well-prepared, well-supported attacks against us. The First Siberian Corps really held the key of the position, and we were not long left in doubt.

When we reached our mountain top the infantry fire around the trenches of Mayetun was still crackling away. It had never ceased during the night. We were told by the First Siberian Rifles, who were occupying the hill and whose colors and color guard were just below the top, that they had been called out on the preceding night to help repulse the enemy who made a night attack from the west with the evident intention to break the line, cross the railroad, and roll up the Russian right. With the assistance of a machine-gun battery the Japanese attack had been defeated. On the preceding day the enemy had not assisted the infantry attack on Mayetun with artillery. They now opened on it with several batteries from the south, and at 6.30 and 6.55 several batteries to the southwest, perhaps 1 verst west of the railroad, also opened on the village of Mayetun. Since the opening of the fight on the preceding day the Russians in the Mayetun trenches had suffered considerably, the field of fire was limited, and the Japanese infantry in their front was concealed by the crops and held its ground within a few hundred yards of the trenches. Many of them lay in a bean field almost at our very feet, and though we looked down upon them from an elevation of 600 or more feet, and though the bean crop was but 3 feet high, we could not see them. All we saw were trodden down places chiefly on the edge of the field toward the trenches. At 6.45 a. m. the Russian battery on the right, which had done so once yesterday, again changed front to the west, swept the south front of the Russian trench, and covered the bean fields and the village beyond with shrapnel fire. There were, however, more Japanese batteries in action than on the preceding day, and that particular Russian battery soon had to turn its fire elsewhere.

A group of Japanese artillery that had been in action yesterday in the neighborhood of Chouchiatun had been the special objective of the two Russian horse batteries. This Japanese artillery changed its position, falling back southward, and then opened again. The fire of the two horse batteries never relaxed against this artillery which several times became silent.

At 7.05 a. m. the enemy's infantry in front of the trench was reinforced. Five or six squads of 10 or 12 men each, in open order and marching by the flank, came out of the village and laid down in the bean field within 200 yards of the trench. A heavy rifle fire now opened; the ground in rear of the Russian trench was covered with empty ammunition cases and we expected to see the Japanese crawling out of the bean field and assaulting the trench, but nothing of the kind happened. The attitude of the Russian infantry remained firm, the Japanese artillery failed to silence the Russian guns, and the purely infantry battle on the west front proceeded all day. Part of this front could not be seen from our point. Our point overlooked the south, southwest, and northwest. The country due west was hidden from us by the main peak with the watchtower. In the course of the afternoon and evening I learned from medical officers who had been there that the Japanese had attacked on the west again and again simply to be shot down, and that they kept up a furious but very ineffective rifle fire.

Our own hill soon also received from the enemy the attention it deserved. We were covered with shrapnel from the southeast, south, southwest, west, and northwest. The fire from the west and northwest (our right rear) was accurate; the shells at our point struck within an area of 25 feet square; on the main peak they made untenable the so-called bombproof at the foot of the tower in which the telegraph and telephone instruments were, so that at 8.30 a. m. the office had to be dismantled, the cables taken down, and messages came up the hill by messenger relays now posted perhaps 75 feet apart.

About 11 a. m. the enemy's fire steadily increased along the entire west and south front of the First Siberian Corps. The concentrated cross fire on the top of our hill rendered it unfit for the position of the corps commander, the noise of bursting shells, the flying fragments and stones, the killing and wounding of messengers interferred so with the dispatch of business that toward noon he and his staff left the hill after he had received two contusions. We now took position with the reserve at the northwestern end of the village of Shoushanpu and west of the Mandarin road. From this new position we had an excellent view of the crest and reverse slopes of our position, but could no longer see what was going on in front.

The enemy's artillery fire grew severe all along the line and the strongest fire was concentrated on our left. It will be remembered that there the ridge which formed the main position merged into the general mass of broken country; in consequence it could not be safely occupied to its southeastern extremity and the last Russian trenches there were constructed across the ridge west of the road from Intaoyang. Infantry firing was soon heard from that direction and we knew that the enemy was assaulting.

Meanwhile two Japanese batteries fired from the west over the northern spur of Shoushan Hill in reply to our two batteries posted there. Having been unable to produce any effect on these two batteries the enemy, soon after midday, increased his range and swept the ground between us and the two Russian batteries. A shrapnel struck the soft ground about 20 paces from our group and burst under a passing Red Cross cart. It knocked down three soldiers, upset the cart, frightened the horse, but did no other damage. Very soon the enemy again increased his range by 100 yards; the shrapnel now burst just beyond us on the other side of the road; the very first one killed two and wounded four men of the reserve. These troops were immediately withdrawn to our side of the road and stationed on the ground heretofore swept by fire but now perfectly safe. A further increase of the enemy's range carried his shrapnel 100 yards beyond us.

This fire now continued to pass over our heads without interruption until dark, and much of it was salvo firing. Other Japanese batteries to the southeast were sweeping the western face of Shoushan, in the evident attempt to reach our two horse batteries and silence them. All along the line from the Mandarin road to Yangchiachuang the enemy shelled not only the position, but also particularly its reverse slopes and the ground in rear. Our two batteries on the crescent ridge were in action all afternoon, and part of the time were reached by the enemy's fire. Other Japanese batteries were shelling the ground about 1,000 yards to the east of us. Certainly not less than five Japanese batteries were engaged in the exclusive task of covering with fire the open ground inclosed by the hills forming the position of the First Siberian

Corps. How many batteries were shelling the position it was impossible to tell. About 1 p. m. the battle on the left raged with great fury, and the chief of staff of General Kondratovich arrived and requested reenforcements. General Stackelberg told him that he had but one and a half battalions left, and could not give him reenforcements. The chief of staff protested that it was impossible to hold out without reenforcements, and Stackelberg directed him to tell his general that if he could not hold his position he could die there. With this message the chief of staff rode off, and the pandemonium of the battle continued. The staff grew nervous, and I was asked by several officers what I thought of the situation. I knew the strength of the position and the character of the trenches, and I knew that, though greatly outnumbered in men and guns, the troops could hold their positions well enough so long as the Russian artillery was not silenced. Anyone who had watched the proceedings on the spot could see that, and I told them so. The Russian left, however, had no artillery support beyond the two batteries on the crescent ridge a mile in rear, and the Thirty-fourth Rifle Regiment had to bear the undivided attention of the enemy's infantry and artillery. At last the fire relaxed somewhat, the infantry fire ceased, and at 2.30 a report came from General Kondratovich that the attack was completely repulsed, that the enemy had succeeded in taking some of the trenches on the extreme left, but had been driven out with the bayonet.

The enemy now turned his attack against the section of the Russian position between the roads from Hsiaoyangtzu to Shoushanpu and Hsinlitun. This part of the position was held by the Third East Siberian Rifles. They were almost smothered under the enemy's fire; in front of their trenches lay piles of Japanese dead, whom they had killed in the night attack. The position became critical, but this magnificent regiment held its ground, though it suffered heavily, and by 4 p. m. the fire relaxed and the attack was repulsed, the infantry fire ceased, and the artillery fire became desultory. Everyone by this time knew, or must have felt from mere instinct, that the First Siberian Corps was contending against great odds, particularly in artillery, and that the enemy would make one more effort—the supreme effort of the day. The Russian position lacked in depth, and should the enemy take our position and plant his guns on our heights, he could sweep every line of retreat as far as Liaoyang and roll up or compel immediate withdrawal of the Third Siberian and Tenth army corps.

At 5 p. m. the storm burst. The fire sweeping the plain inclosed by the hills of the Russian position had continued so far without interruption, and was now increased. The attack again fell on the position of the Third East Siberian Rifles, on which the enemy concentrated every available gun. The artillery fire was tremendous, and gradually increased in severity and reached its climax by 6.40 p. m. We all estimated the enemy's guns not far short of 250. It is useless to attempt a description of the spectacle. The enemy shelled the position, the reverse slopes of the position, and the ground in rear for nearly a mile. The first high hill east of the mountain road received the enemy's main attention; the shrapnel burst so fast that it was impossible to count them. Some batteries southwest of this hill shelled the reverse slopes. The shrapnel had a high angle of fall, and served to prove the wisdom of the sappers in constructing the emplacements for the local reserves on the steepest slopes so that nothing short of mortar fire could reach them.

The great seriousness of the situation became apparent at once; the last local reserves were going up to reenforce the men in the trenches; men were constantly carrying up small arms ammunition. Other men were coming down the hill, and at 5.45 General Stackelberg issued orders that no man should leave the position without orders. The news received this day that the Port Arthur garrison had repulsed a great assault by the enemy was communicated to the troops on the firing line. By 6 p. m. the aspect of the battle had become truly terrible, and by that time a special message from the Czar to the Third Regiment, promising them in case of successful resistance the highest honor he could bestow on them, in proclaiming them his relatives was received. This would give every man the right to be admitted to the Czar whenever he should desire to do so. The infantry fire was almost drowned under the roar of the guns and the burst of the shrapnel, and yet the artillery fire was still increasing and began to sound almost like the fire of a skirmish line. The enemy now also used high-explosive shells; great clouds of dirt and stones flew into the air. He advanced his infantry, compelling the Russians to show themselves and open fire, and at the same time he blew their trenches about their ears and covered them with a whirlwind of shrapnel. At 6.40 p. m. the fury of the action had risen to a height of which neither pen nor brush will ever be able to render an adequate description. It is small wonder that some Russian officers went insane during the action. Yet the Russian infantry declined to yield up its position under the pressure of the Japanese artillery fire.

The Russian artillery had faithfully held its ground and never slackened its fire. The empty ammunition wagons, mostly in groups of three, traveled all day to and fro between the batteries and the parks a mile in rear, and now the park was empty. Messages and officers were sent to Liaoyang, who got the last 16 ammunition wagons there and brought them to the field just in the nick of time.

Seeing the firm attitude of the Russian infantry, the enemy did not advance his own infantry to the actual assault. For the most part they halted at the edge of the fields at the foot of our hills. After sundown the artillery fire gradually died out; the enemy had suffered a bloody repulse all along the line. On the western foot of Shoushan Hill a furious fight had also been raging all afternoon and evening, and here the Russians held their trenches without trouble, being less hampered by artillery fire.

The battle was over so far as we were concerned; the enemy had been repulsed. We estimated our losses at over 3,000 in the two days. The Third Siberian Rifles had fired away a million and a half of cartridges; the artillery of the First and Third Siberian Corps had expended 108,000 shrapnel in two days. The enemy's shrapnel fire was high and might have done more execution than it did. The statistics of losses are incomplete. The commanding officer of the four batteries of the First East Siberian Rifles Division reported to General Stackelberg on a subsequent date that he had lost 124 killed and 40 wounded on August 30 and 31, and that the First Battery had 4 killed, 41 wounded, and all others contused. Colonel Mushnitzki, of the Thirty-fifth East Siberian Rifles, stated that he lost at Liaoyang 508 killed and wounded, or 25 per cent of the budgetary establishment and 35 per cent of the force he took into action. On September 10 General Stackelberg said at dinner that since and including Telissu, Kondratovich had lost 7,000 men and had only 93 officers for duty instead of nearly 300.

On September 12 General Stackelberg said that he lost at Liaoyang 3,700 men, including 92 officers, which with all previous losses made 190 officers killed and wounded; that including and since Telissu he had lost 8,000 killed and wounded, i. e., 50 per cent of effectives who went into action, and that the health of the command was good, there being but 400 on sick report besides the wounded.

As it grew dark in the evening of the 31st of August the artillery fire ceased, but on the west front the infantry fire continued all night. We were informed that the First Siberian Corps would be withdrawn to a reserve position and was to be relieved by the Second Siberian Corps.

At 12.45 a. m. we marched from Shoushanpu and reached Liaoyang at 2.30 a. m. At Liaoyang the general remained over night with General Kuropatkin, while the rest of the staff proceeded to Kaolichiang, some 5 miles north of Liaoyang on the right bank of the Taitzu, where we arrived at 5 a. m.

General Stackelberg arrived at Kaolichiang early in the morning. At 1 p. m. a violent cannonade opened to the south which was still going on at 9 p. m. We now learned that no new troops had relieved us in the position south of Liaoyang; that we were simply withdrawn, and that the troops who "relieved" us were in the works of Liaoyang. On the west the enemy could not be readily shaken off, for at 3 a. m. we still heard the infantry fire in that direction. During the day the troops of the corps assembled in the vicinity of Kaolichiang.

At 5 a. m. September 2 we were on the march again and learned for the first time that Kuroki had crossed the river east of Liaoyang and was menacing Kuropatkin's communications and that we were marching to attack him in flank, for the general addressed his troops and told them that they would now take the offensive and attack Kuroki.

On the march we learned that the Tenth Army Corps and Third Siberian Corps were on our right facing southeast; that we were to prolong their front and connect on our left with Orlov's division of the Fifth Siberian Corps.

It seems that Kuropatkin was then assembling a large force north of the Taitzu to crush Kuroki; that Orlov after the arrival of the First Siberian Corps was to advance southward, while the First and Third Siberian Corps and the Tenth Corps should advance from the west. Orlov had advanced single handed an hour before our arrival, his troops were old reservists fresh from the plow and rusty in the soldier's trade, and just arrived from Europe. In the rolling country and the high crops they lost their bearings; received sudden flank fire from the Japanese, and in replying to it fired into each other, got stampeded and defeated. As we rode through the village (Liulinkou)[a] we found a battery of Orlov's division that evidently was hiding there and was blocking the way of our own batteries. One of our batteries came into action north of the village and three south of the village, and our infantry was thrown forward just in time to form a rallying point for Orlov's troops.

It was about 11 a. m. when our batteries opened fire. We now expected to see our corps continue to advance in a northeasterly direction and seize those hills, but beyond maintaining a cannonade against them nothing was done. It was 3 p. m. before the Japanese replied with artillery, a sure sign that in our front they were weak in that arm. Early in the afternoon the Cossack Horse Battery fell back from its position, stating that they were without infantry supports and were receiving infantry fire. The three batteries southeast of the village were now also withdrawn to a position about 900 yards in rear where they opened fire. One battery and the machine-gun battery were in reserve. The four batteries in action kept up their fire until dark, the enemy replying with but one battery and doing poor shooting.

East of us was a chain of hills running from north to south to the Taitzu River and evidently covering the road and valley by which Kuroki's column had advanced. Near the Taitzu it is joined by a ridge of hills running east and west on the right bank of that river. Toward evening the Russian troops in that vicinity opened a heavy fire against the angle where the two ridges joined; there was a low hill and a pass and at 6.30 p. m. a heavy infantry fire broke out there. An officer of the general staff told us that the Tenth and Seventeenth corps were endeavoring to take that pass by a night attack. Our artillery fire ceased when darkness came on; the infantry fire to the southwest lasted until 10 p. m. The attack had evidently failed, for at 2 a. m. (September 3) we marched southwest to close in a verst or two on our other troops.

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[a] Sheet No. 4, map of Manchuria.

During the day the army changed front and was facing east, with the First Siberian Corps posted with its left resting on the Yantai coal road and Mishchenko's command on the right. We slept that night in West Talienkou. Next morning headquarters moved to East Talienkou, where we spent the day (September 4). Things remained quiet all along the line, but in the evening a heavy artillery fire opened on our left rear toward Yentai station. Orders came at once to saddle up and for the baggage to move out at once. We learned afterwards that the Ninth East Siberian Rifles Division had handsomely repulsed a Japanese advance from the direction of the coal mines against the railway station.

At midnight the enemy launched a night attack which included our village; we moved out 600 yards to the railroad and took station near the machine-gun battery to watch events. General Gerngros was there with his staff. When the attack came close our machine-gun battery opened on the enemy at 100 yards range for one minute, after which things quieted down. The Second East Siberian Rifles Regiment had lost 400 men in this night attack.

At 6.30 a. m. (September 5) we reached the hills east and northeast of Yentai, where we found our Ninth Division in position facing east and confronting the enemy, while our First Division shook off the enemy and came marching along to prolong the left of the Ninth Division. From 7.30 to 8.30 it rained heavily. At 8.30 a. m. we struck the enemy's northernmost advance guard near Yumentzu. They were busy throwing up trenches on a hill; we confronted them within rifle range on a hill to the west. The Russians maintained a slow rifle fire against them, which seemed to annoy them, for every once in a while they dropped their tools and opened on us with their rifles. Two Russian batteries on the plain nearly a mile back of our hill opened on the Japan hill, the fire being directed from our hill by telephone. 11 a. m. we reached a temple on a hill west of the village Soukuantzu where we had a good view to the south and we Three miles to the southwest lay Yentai station, between and the railroad columns of wagon trains were marching several roads and others were visible west of the railro At 12.45 p. m. several Japanese batteries opened from direction of Nantai and shelled Yentai station and its vicini accelerating the pace of the trains. We learned later t the Seventeenth Army Corps lost two trains that day. Ab 1.30 p. m. we rode to the village Choukuantun. At 5 p. we reached the village of Hungchiatien where we quarte ourselves on the priest.

On September 6 we marched at 7 a. m.; everything h been quiet during the night and not a shot fired. About no we crossed the Sha River 1 mile northeast of Shahopu a reached Taichiapu.

On September 7 we marched at 7 a. m. and reached t Hun River at Hunhopu at 11 a. m., and at noon the Fi Siberian Corps crossed by the bridge. There were ma troops and a large mass of transportation ready to cross, b the use of the bridge had been assigned to General Stack berg, who took possesion of it and had his corps file past hi At 5 p. m. the crossing was completed and at 6.30 we w comfortably quartered in the southeastern part of Mukden.

The march of Kuropatkin's army between Liaoyang a Mukden was orderly and well regulated. The various co reached the destinations stated below:

	September 4.	September 5.	Septembe
First Siberian Corps.	Tallenkou.	Hunchiatien.	Taichiapu.
Third Siberian Corps.	Liulinkou.	Huanshan.	Changhut
Seventeenth Army Corps.	Santaopa.	Shihliho.	Hsiaoche
Tenth Army Corps.	Taumiaotzu.	Shahopu.	Hunhopu.
Fourth Siberian Corps.	Tanhopu.	Wulikai.	Mukden.
Second Siberian Corps.	Tanhopu.	Lantzukai.	Suchiatun.
Fifth Siberian Corps.			Suchiatun.
First Siberian Corps.			Mukden.

MUKDEN.

Where the Hun River leaves the hills, there in the plain lies Mukden, a prosperous city of over 200,000 inhabitants and the home of the reigning dynasty in China. The railroad and the great Mandarin road furnish convenient highways to the north and south. Another highroad runs slightly northwest toward Hsinminting, the terminus of the railroad from Tientsin, while the river Hun furnishes a convenient communication with the sea. Eastward the means of communication are limited to ordinary Chinese roads and trails and the river is navigable only for small boats. To the northwest and northeast of this city are the tombs of Chinese rulers of the present dynasty.

Being the great mart of Manchuria and having the communications mentioned above, Mukden forms a strategic point of the first order. The city itself contained great quantities of supplies, and here also were the Chinese merchant princes whose business connections extended to Tientsin and Peking, throughout northern and eastern Manchuria, and to the farthest corners of Mongolia and even to the caravan routes that cross the great desert to Lake Baikal. It was only necessary to make contracts with these merchants in order to command all the resources of the country. This was of the utmost importance for the Russian army.

The capacity of the Siberian railroad was limited. In order to contend successfully with the enemy, the Russian army had to be greatly augmented and the transport of these troops would absorb a large part of the capacity of the railroad. Moreover, the Russian army when thus greatly augmented would have to be supplied with winter clothing before winter set in and subsisted during the winter. Among the staples of the Mukden market are furs, from the ordinary sheepskin to the high-priced sable. Mukden is, in fact, one of the great fur markets of the world. Near Fushun were coal mines, which formed the only source of coal supply now that the Yentai coal mines were in the hands of the enemy.

Forty-five miles north of Mukden the hills from the east and west closed in on each other near Tiehling, leaving but a narrow valley, and here the great, flat, fertile plain of southern Manchuria ended. To the north, so far as I have seen from the cars, the country is neither so populous nor so fertile as the south, great stretches of it seem almost barren, and it only far to the north, along the Sungari River, that th country looks better, though not nearly so well as in th southern plain.

It meant, therefore, much to Kuropatkin if he should b able to hold Mukden during the fall and winter. To give u Mukden meant the loss of a great source of supplies of a kinds which would then accrue to the benefit of the Japanese The greatest gain of the enemy, however, would be a politica one, in having wrested from the grasp of the Russians the grea Manchu capital.

Just when Kuropatkin decided to hold Mukden I do no know. When we first arrived there seemed to be some doub whether or not the army would arrest its march there or continue to Tiehling, but the disposition of the army corps soon showed that a further retreat was not contemplated. And there was a further indication of this furnished by the Chinese merchants. When we first arrived the market was extremely limited, but in a few days all that had changed, the merchandise that had been buried or sent away reappeared as if by magic, and the market was in full blast everywhere.

Kuropatkin now disposed the Fifth Siberian Corps, which had arrived, between Mukden and Hsinminting; the Third Siberian Corps was sent 25 miles east to Fushun, the First Siberian Corps 6 miles east to Fuling; the First Army Corps arriving from Russia was assembling at Puho, 15 miles north of Mukden; the bulk of the remaining troops remained south of the Hun and the cavalry covered the front. A considerable bridge head covered the great railway bridge near Mukden, and the First and Third Siberian Corps now fortified the line of the river from Fuling to Fushun. These fortifications were constructed partly on the banks of the river, partly on the hills bordering the right bank. Where the river ran at some distance from the hills battery emplacements and trenches were constructed near the bank. At proper places lines of abattis covered the approaches, and in rear a continuous line of well-constructed, well-placed, well-concealed trenches ran from Fuling to Fushun. Where the river ran close to the hills or where it was fordable entanglements were placed in the river by filling it with large branches of trees.

So far as the enemy is concerned, it seems that he halted on the line of the Yentai coal road.

A pause now ensued in the operations which lasted until October 5 and was utilized by Kuropatkin to reorganize and refit his army.

THE SHAHO CAMPAIGN.[a]

For the purpose of taking the offensive, Kuropatkin organized his army in three groups.

The left or eastern group (also called First Army or East Detachment) included the First, Second, and Third Siberian Corps and was commanded by General Stackelberg. Its object was to take Pienniulupu, and, advancing thence southward, seize Chaohsienling and Tumentzuling and the crossing of the Taitzu River at Pensihu.

The right, consisting of the Tenth and Seventeenth Army Corps and Fifth and Sixth Siberian Corps and Grekov's cavalry division, was to advance on both sides of the railroad, under command of General Bilderling.

The center, consisting of the First Army Corps and the Fourth Siberian Corps and Mishchenko's cavalry (and subsequently of the First Siberian Corps), was under Kuropatkin's own direction.

On October 5, 1904, we left Liamiwasa with the headquarters of the East Department, General Stackelberg commanding, and reached in the evening the little village of Pachiatai, near Tunkou, after a march of 18 miles. The three corps marched each in two columns on as many roads, with a general front of 16 miles. Two bridges had been constructed for each corps to cross the Hun River. Every one was in high spirits, now that we marched against the enemy instead of waiting for him as heretofore. In the evening the First Siberian Corps was at Yantaitzu and Shahotzu on the right, the Second Siberian Corps at Yuanchiapinkou and Tunkou in the center and the Third Siberian Corps at Shihuichen and Erhtaokou on the left. Samsonoff's cavalry was at Houlaotzukou, 12 miles in front of the center. Rennenkampf's mixed detachment was at Hsiaochiahotzu, on the Taitzu River.

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[a] Sheets Nos. 2. 4, and 5, map of Manchuria.

October 6 the headquarters moved to Chisunpu, 12 mil to the south; the First Siberian Corps reached Houshitai an Taizamuza on the right, the Second Siberian Corps came t Chisunpu, and the Third Siberian Corps reached Hanmiolin and Pachiatzu. The left column of this latter corps was o the direct road from Fushun to Hsiaochiahotzu, on the Taitz River. Samsonoff's cavalry advanced to Huanlingtzu.

The advance guard of the center (First Army Corps, Fourt Siberian Corps, and Mishchenko's cavalry) reached Huanshan Of the West Detachment (Tenth and Seventeenth Arm Corps, Grekov's Orenburg Cossack brigade, and subsequently also Fifth and Sixth Siberian Corps, General Bilderling commanding) the main body of the Tenth Army Corp was at Shahopu, with advance guards at Hunpaoshan an Chianghutun; the Seventeenth Corps was on the railroad abreast of the Tenth Army Corps.

The West Detachment was thus considerably in advance of the East Detachment and the center was refused.

October 7 the East Detachment remained in its position. In the center the Fourth Siberian Corps came forward to Erhtaokou, with advance guard at Hsinglungtun.

Of the West Detachment the Tenth Army Corps remained stationary and the Seventeenth Corps sent advance guards to Wulikai and Shihliho.

The Fifth Siberian Corps occupied Changhutun, on the Hun, and the Sixth Siberian Corps assembled at Tasuchiapu.

October 8 our headquarters moved 6 miles to the front, to Yangmulingtzu, while our troops remained stationary, except Samsonoff, who moved to Hsiaochiahotzu, from which place Rennenkampf moved forward to Weiningying. The main body of the Seventeenth Army Corps and Grekov's cavalry remained stationary; the advance guards of the Tenth Army Corps reached Hungchiatien and Tsaotaitzu, Mishchenko at Liufangtzu. Main positions of West Army at Liutunkou.

October 9 our headquarters moved to Pienniulupu, the First Siberian Corps to Hsiaoshihchiaotzu, the Second Siberrian Corps to Pienniulupu, the Third Siberian Corps to Kaotaitzu.

The main position of the West Army was still at Liutunkou, advance guards Seventeenth Army Corps at Wulitaitzu and Hsiaolankou; advance guard of Tenth Army Corps to Sankuaishi, Mishchenko at Tapu; main position of West Army remained at Liutunkou; in the center, head of the First Army Corps reached Tungshankou, Fourth Siberian Corps Yangchengchai with advance guard and Haniutun with main body. Sixth Siberian Corps as reserve at Shulingtzu.

October 10 the troops of the East Detachment remained stationary.

In the center the Fourth Siberian Corps advanced with its main body to Yangchengchai and its advance guard to Hsiaoliuhotzu.

At 6 a. m. on October 11 we were on the march southward. From Pienniulupu the valley runs due south to the village of Hsiaoshihchiaotzu. At this point a lozenge-shaped mountain feature protrudes and divides the valley into two courses—one running southeast, the other to the southwest. We entered the former and ascended a ridge which commanded a good view of the country. Before we reached that point our guns had opened to the southeast, where the batteries of the Third Corps near Kaotaitzu were shelling the Japanese positions in the mountains in their front. The task of the First Siberian Corps was to take the passes to the east and west of the lozenge, which command the direct road to Pensihu. The Second Siberian Corps was in reserve at Hsiaoshihchiaotzu. At 6.50 we heard the guns of the Fourth Siberian Corps west of the mountains. The corps was fighting at Hsiaoliuhotzu, which was situated 8 miles west of us on the road leading over the Chaohsienling Pass down into the valley of Hsiaoshihchiaotzu. A glance at the map will show that success of the Fourth Siberian Corps would bring the Japanese garrison of the Chaohsienling Pass between two fires from east and west. But the Fourth Siberian Corps made no headway, though it held its own throughout the day.

On our side two regiments and three batteries attacked the Tumentzuling Pass on the southwest face of the lozenge, and a similar detachment moved against the southeast face of the lozenge. Before the main attack could be made the Japanese had to be driven out of the broken mass of hills of the lozenge to the passes, and progress was slow.

On the march from the Hun south Colonel Waters, of the British army, and myself had discussed the situation and I asked him whether he had attempted to prognosticate wh the action of the Japanese would be, and he said he had no I then told him how the Japanese operations everywhe showed the earmarks of the well-digested German text-boo and that in this case, even if the case were not provided for i text-book, common sense would cause the Japanese com mander to avail himself of the defensive advantages of th rough country in our front to contain us with a very sma force, to mass all available troops in the more open country t the west, and break Kuropatkin's center. And this ver thing happened. But three Japanese batteries showed them selves that day opposite us, a sure sign that the enemy wa not in force.

At 10 a. m. General Stackelberg changed his position to hill in the northern portion of the lozenge where the staff o the First Siberian Corps also was. At our feet was the villag of Hsiaotakai, where two batteries were in action, the infantry was concealed and we only caught occasional glimpses of small skirmish lines as they were slowly driving the Japanese back into the passes. The attack on the eastern pass was also made by two regiments, assisted by several batteries, but was concealed from our view.

The right attack was brought to a temporary standstill by a turning movement of the enemy, which, however, was neutralized by additional Russian troops thrown into the fight.

The fighting was desultory; occasionally when the Russians attacked a new section the infantry and artillery fire became severe. Whenever the Japanese batteries opened they were immediately smothered by the Russian batteries, and were never able to fire for more than ten minutes at a time. It was late in the afternoon before the Russian infantry became visible at the foot of the high wooded hill situated between the passes. In the middle of the day it had gotten quite warm; the constant fighting and hill climbing imposed great exertions on the heavily laden Russian soldier. At 6 p. m. we returned with General Stackelberg to Hsiaoshihchiaotzu, where we spent the night.

The general and his chief of staff seemed dissatisfied with the day's work. Next morning, October 12, we learned that the reports received from the front indicated that the troops had everywhere brought up against almost vertical mountain iles. We had been told that during the night the troops uld be reinforced and that the wooded hill between the sses would be taken during the night or in the morning. e Russian guns opened at daybreak and at daylight heavy antry fire was going on along the entire line, but the artilry was still shelling the wooded hill, an acknowledgment at the Japanese still held it. At 6 a. m. our horses were ddled and the baggage stood ready to pull out, and though e fight was raging hotly, Stackelberg did not go to the front, sure sign that something had gone wrong somewhere. The und of the guns west of the mountains was farther north an on the preceding day, and at 8 a. m. the assistant of the ief of staff told us that the Fourth Siberian Corps had aintained its advanced position on the preceding day, but ad to fall back during the night. A further ominous sign as that at 7 a. m. the Nineteenth East Siberian Rifles Regient (Fifth East Siberian Rifles Division, reserve) marched rough our village, ascended the heights whence we had served the battle on the preceding day, and began to trench there, and another regiment from our reserve was nt away toward the Fourth Siberian Corps. At 8.30 a. m. e were told the attack against the passes was progressing orably, and at 9.20 word came that the passes had been aken at 8.40 a. m., but at 9.20 the Russian artillery was still elling the wooded hill. From 9.30 to 11 a. m. the cannonde west of the mountains was furious.

At 11.10 a. m. General Stackelberg left the village; we were ding northward, retreating, and the baggage was also going rth. We struck out for a high hill west of Pienniulupu at interposed between us and the Fourth Siberian Corps. route the general inspected some new trenches that faced uth and were evidently intended for a rear guard to prevent e enemy from coming out of his passes. The reserve cond Siberian Corps) was getting ready to march. At 20 p. m. we reached the top of the high hill mentioned, ch afforded a good view over the country to the west. m this point we saw the Japanese shrapnel bursting over e last crest of hills toward Fengchiapu and no Russian tillery replied. To the west and northwest a great battle s waging and there was a wide gap between us and that ttle. The Japanese had made good their method again and punched a large hole through Kuropatkin's line at t most sensitive point. At 1.25 p. m. a battalion of the Eigh eenth East Siberian Regiment reached the top of our h and I asked whether it was the rear guard and was prompt informed that it was the advance guard. In the valley had behind us, the Second Siberian Corps was marching nort the artillery and trains on the roads, the infantry in fo columns across country, while the firing against the pass farther south continued. As seen from our hill the situati looked very serious and for once the general staff, knowi that we attachés (Colonel Waters and myself) could not he appreciating the situation at its true value, volunteered t information that they hoped to close the gap by 5 p. m. wi 4 regiments and 3 batteries (Second Siberian Corps). I sa the batteries in position before 5 p. m., and I knew very w that one division could fill no more than one-third of th gap. At 2.10 p. m. we left the hill and reached Pienniulup at 2.50 p. m.

At 4.50 p. m. one of the staff officers informed us that th First and Third corps had taken all the passes they ha attacked. This may be true, as each pass consisted several sections; he did not say that the most importa section remained to be taken before the passes could be calle ours. At 5.05 p. m. Mr. Charles Hands, an English corre pondent, passed through Pienniulupu. He had been with th Third Corps and said they had taken nothing and lost 2,00 men the day before.

October 13. At Pienniulupu the Sha River makes almo a right angle and flows away to the northwest to Fengchiapu 8 miles distant, through a flat valley nearly a mile in widtl The hills on the right bank do not rise over 450 feet with thei highest points; on the left bank the elevations are mor prominent, the chief features of which are three ridges with general direction from the southwest to the northeast. Th one opposite Pienniulupu, on which we were yesterday, w will call No. 1, or Twin Peak; the northernmost, No. 3, wa south of Fengchiapu, and between them was No. 2, called b us Temple Hill (not to be mistaken for the Temple Hi mentioned in Kuropatkin's dispatches). This Temple Hi was a ridge perhaps 1½ miles long, with a saddle in the middle whence the higher northern part rose steeply. The top o northern ridge was 1,000 yards long and on its northern-st peak was a pretty little temple. The southern part of ridge was lower, broader, and wooded.

At 7 a. m. General Stackelberg left Pienniulupu. We ched the temple on the hill at 8.40. The Eighteenth East erian Rifles Regiment was intrenching the hill. From the ple we had a better view than from Hill No. 1 on the pre-ling day. In the plain to the west not more than 5 miles ay Japanese batteries were in action on the open plain and eiving a feeble and apparently ill-directed fire from the rth. Below us, 2 miles to the west, a low pass between our ll and Hill No. 3 gave access to the plain and the Japanese tteries. Hill No. 3 had yesterday been in possession of the urth Siberian Corps, to-day the Japanese had it and were renching it. Nothing seemed more natural than that eneral Stackelberg should leave rear guards at the southern sses to keep the Japanese busy there, seize the little pass t of us, and deliver a blow against the Japanese flank, for e were planted across that flank. A vigorous attack here h 25,000 men driven into the naked flank and rear of the panese was bound not only to disengage the sorely pressed urth Siberian Corps, but to produce other far-reaching ults.

On the hill behind the temple two artillerymen sat in a hole ng into the ground. They were equipped with a telescope nd portable telephone which connected them with the bat-ies we had inspected in the morning. At 9.10 a. m. we left e hill. At 9.45 some messages were received, and we halted r an hour while orders were being issued. The Eighteenth st Siberian Rifle Regiment came down from the hill and rched away to the north and so did one of the batteries. A battery of the Third Corps was also coming up the valley. t 11.30 we joined the reserves concentrated at the northern ot of Temple Hill, consisting of some infantry and several tteries. Ten minutes later the entire body moved off, and eral Stackelberg rode off in the direction of the gap through hich we could assail the Japanese flank, and the troops oved in the same direction. We marched around the north ot of Temple Hill, turned westward, entered the ground tween the Temple Hill and Hill No. 3, and halted on a spur here General Zasulich (commanding the Second Siberian

Corps) had taken post near a battery. The troops entered the same ground, cavalry and the Okhotniks (mounted infantry detachment) in front, marched westward, and halted under cover of a low ridge which protected them from any fire from Hill No. 3. Several companies of infantry were deployed and occupied this low ridge. The cavalry had dismounted 1,000 yards farther on, and also threw a skirmish line on the ridge, in prolongation westward of the line of infantry. The mounted infantrymen rode up the valley toward the pass. Three batteries came into action, facing north, and shelling the Japanese who were intrenching on Hill No. 3, and Mishchenko's battery was shelling it from the northeast. In this way our right flank would be well protected against Hill No. 3, while the main body, entirely concealed from view, could march westward to the attack. Near the pass to the west a few Russian scouts appeared carefully reconnoitering the ground. They were soon followed by a squad, and other scouts and squads appeared, and finally two skirmish lines emerged from some fold of the ground and made their way up the slopes of the low red hill commanding the pass. I watched them for forty minutes through my glass. When two-thirds up they halted at the foot of a steep slope, reformed in two lines, and went over the crest with a rush. The pass was ours.

While this was going on the chief of staff had assembled all the aids and orderly officers and dictated a lengthy order, which was then carefully read and compared and finally dispatched. Whether that order was arranging for an attack on the enemy or for a retreat we did not know, but we soon discovered that it was the latter. At 3.55 p. m. one of the batteries limbered up and withdrew. At 4 p. m. General Kuropatkin's balloon rose 6 or 8 miles north of us. After 4 o'clock the battery that we had left on the other side of Temple Hill shelled the heights south of the pass our infantry had taken, firing indirect over the col which divided that hill into two parts, the fire being directed from the observing station on Temple Hill. One of the batteries near us assisted. I could not discover any Japanese there; it is possible that their khaki uniforms so blended with the color of the hillside that they could only be made out with a telescope. Toward evening the cannonade became quite lively. At 6.10 p. m. we reached Pienniulupu, and after a time we learned that we were going to bivouac until the main body of the First Siberian Corps arrived. That meant that the attack on the southern passes had failed and was to be given up; that our movements that day had been a mere demonstration, and that we were falling back north of the Sha River. I have since learned that we were making a feint to cover the Fourth Siberian Corps, which retreated to Fengchiapu.

October 14, at 9.27 a. m., the headquarters left Pienniulupu, and after a slow march we reached Kangtolishan about 11 a. m. My notes for that day read as follows: "4.15 a. m. heavy artillery fire west from right or center of Kuropatkin's army; 6.15 a. m. still continues. Stackelberg and staff still at Pienniulupu." At 6.45 a. m. Neff (orderly officer) says the Japs pushed their attacks hard all day yesterday against the Russian center, so as to break it quite in two and drive the First Army (the East Detachment) into the mountains, so as to prevent its reaching Mukden; First Army is to retreat, First Siberian Corps leading, Third Corps on other road east as flank guard, and Second Siberian Corps as rear guard. First Siberian Corps did not reach Pienniulupu last night. Hence, headquarters staff bivouacked there all night waiting for it. Gerngros came at 1.30 a. m. to see Commanding General Stackelberg. Neff says Tenth and Seventeenth Corps had very heavy losses yesterday; 8.05 a. m., artillery fire on Kuropatkin's right still very hot; 8.50 a. m., no diminution in artillery fire; 9.27, commanding general leaves Pienniulupu and marches just ahead of rear regiment First Siberian Corps; 10.35 a. m., artillery fire to west and northwest as hot as ever; 11.30 a. m., judging by sound of guns, Japs seem to have progressed north. Noon, fire of our rear guard or flank guard infantry and of Jap infantry audible where we are, at Kangtolishan. Desperate struggle evidently going on in Russian right wing; 1.30 p. m., commanding general still at Kangtolishan, and orders being issued for Third Army to move west or northwest, the orders for the First Siberian Corps "being most important." At 1.55 p. m. scarcely any firing audible from Kangtolishan; 2.15 p. m., no firing except very great distance northwest.

At 2.30 p. m. assistant to chief of staff says Stackelberg has asked for permission to attack Japanese right flank, and in anticipation retreat of First Army has been stopped and is now marching, so as to be able to attack to-morrow. At noon Stackelberg had dispatched staff officer to Kuropatkin to ask for this permission. At 3. p. m. we are not yet in wire communication with commander in chief; we have been here nearly five hours; 4.45 p. m., Ninth East Siberian Rifles Division arrives from Yingpan, having been recalled to march on Fengchiapu northwest of Kangtolishan; 7.30 p. m., staff officer has not yet returned from Kuropatkin, and Stackelberg decides to bivouac in Kangtolishan.

We all had seen the opportunity for a flank attack on the Japanese, and admired Stackelberg's initiative in countermanding the retreat and putting his troops in position for the offensive. Kuropatkin had evidently been hard pressed and took our entire First Siberian Corps and several other regiments under his personal command. This of course was one way of restoring the situation, but I can not but believe that a flank attack by Stackelberg would have brought the same result and in a more effective way.

General Stackelberg's remaining troops took up a defensive position. Looking at the map we see that at Pienniulupu the Sha River makes almost a right angle. So far its course has been from the northeast to the southwest; at Peinniulupu it changes to the northwest. The Second Siberian Corps occupied the heights on the right bank from Pienniulupu to the northwest for 9 versts (6 miles); the Third Siberian Corps occupied the hills extending on the right bank from Pienniulupu to the northeast, including the Wangfuling. The cavalry of Samsonov occupied the Huanlin valley, and General Rennenkampf formed the extreme left at Hsiaochiahotzu, on the Taitszu River. This practically remained the position of the East Detachment (minus First Siberian Corps) until my recall.

On the 15th General Kuropatkin's army had been practically pushed back over the Sha River. He ordered a general advance along the line during the night of the 15th, which, however, was confined to an attack on Lone Tree Hill. After a bombardment by 60 guns in the afternoon, the hill was taken after dark by six regiments and called "Putilov Hill" in honor of the senior officer present in the assault.

October 16, at Yangmulingtzu, we had communications with Kuropatkin's headquarters by telegraph only. The telephone wire ran through to Kangtolishan. On the afternoon of this day we galloped from Yangmulingtzu to a hill in our position at Tangchiatun, where we watched some Russian troops taking possession of Temple Hill, on the left bank of the Sha River.

This position commanded the ground between Hill No. 1 and Hill No. 3 and denied to the enemy the left bank of the Sha River from Fengchiapu nearly to Pienniulupu and it had to be expected that they would attempt to capture it. The attack took place October 27 in broad daylight, not at night as we had expected. The position was an exposed one; it had no artillery of its own for none could be dragged up there. The guns on the heights on the right bank of the Sha River could sweep the eastern slopes of the hill as far as the col, but the western slopes were invisible.

The hill being so far away the enemy could post his batteries beyond the reach and sight of our guns and shell the hill to his heart's content. On the morning of October 27 we were riding with General Stackelberg over part of the position near Pienniulupu when some Japanese batteries southwest of Temple Hill (out of sight and reach of the Russian guns) opened fire on the trenches with high explosive shells. As these batteries could not be molested they probably came close, for their fire was very accurate. General Stackelberg immediately dispatched Lieutenant-Colonel Andreiev, of the general staff, to Temple Hill, where he remained until the hill was taken. At noon more artillery opened fire with shrapnel and at 2.30 p. m. several regiments assaulted the hill. A small part of the infantry were visible on the east slopes and taken under fire by our batteries, but the hill was lost. On his return I had a conversation with Lieutenant-Colonel Andreiev, who told me that the defenders numbered 1,200 men and 2 machine guns, and that the Russians abandoned one of these guns and lost 60 killed and 340 wounded; that the high explosive shells were very effective and that nearly all the losses were due to them; that splinterproofs were no protection against these shells and that they and the trenches were destroyed by them; that contrary to the regulations the local commander allowed his men to carry the wounded down the hill; that the shrapnel fire was not nearly so effective; that when the high explosive fire ceased the worst was over, the wounded were safe then and might just as well have waited; that when the final assault materialized there were not more than 300 men left to defend the mountain, and that when the two sides closed on each other they no longer took time to load and fire, but threw big stones at each other, and that the mountain would have been held if the commanding officer had not allowed so many of his men to carry the wounded away.

On October 20 our headquarters were shifted to Kangtolishan and remained there until I was recalled. Beyond the capture of Temple Hill on October 27, which has already been related, nothing of importance happened.

By this time it had become quite cool and our creek froze every night. The weather remained bright and was not unpleasant in the middle of the day and sensibly cold at night. The roads were hard and excellent. Ever since the First army (East Detachment) had settled down in this section the troops had been kept at work intrenching, constructing line after line of defense. Now that it was getting cold and it appeared that the enemy would make no further move for some time, the troops were ordered to build winter quarters. These consisted of excavations in the ground, over which a timber roof was built and covered in with kaoliang and earth. For the troops stationed in the positions strong lean-to's were built on the reverse slopes just behind their trenches. The necessary timber was carried by the men several miles to the position. The front of the lean-to's was almost entirely open so that the men could get out quickly if needed, the floor was covered with straw, and the men were so packed in them that with their sheepskin coats and overcoats they were fairly warm. Fireplaces were also provided for cooking. I inspected one of these quarters for a platoon. It was built as just described and resembled a very strong splinterproof, the timbers were strong, the roof sloping and covered with 18 inches of earth and sodded. At one end a separate compartment had been constructed for an officer, about 8 by 8 feet, with a fireplace for heating and cooking, and a chimney. Bricks are cheap in Manchuria. They lie around everywhere and can be taken from old walls, etc. They were collected by the soldiers for fireplaces and chimneys. All this work was done by the men under the supervision of sappers. There were many forms of underground dwellings, all very neatly and strongly made. The sappers greatly distinguished themselves in the war by the quantity and quality of their work. Officers and men were a fine body of troops, to whom the army is greatly indebted for their indefatigable zeal, thoroughness, and resourcefulness.

THE RUSSIAN SOLDIER.

The law of universal liability to service prevails in Russia. Still there are so many exceptions and exemptions allowed that practically only the most undesirable class of young men serve with the colors, a very large percentage of which can not read and write.

The average young man on joining the colors leaves behind him a life of poverty, privation, and hard work, without a gleam of the comforts and enjoyments of life that our lowliest laboring man calls his own. As most of the men on joining the army enter a higher level of life they are good comrades. There is much sentiment in the make-up of the Russian's character. Universal hardship has bred universal friendship; universal poverty has bred universal hospitality—that hospitality which refrains from questions until the guest's hunger is appeased. Physically the soldier is generally a magnificent specimen. In the squalid surroundings of Russian peasant life only the fittest have a chance to live. High living has not made his system delicate or his blood impure. He is used to living in crowded habitations; he is uncommonly well able to live in large, crowded masses in camps, and has capacity for digesting a quantity of bacilli that would slaughter the beef-eating armies. His main food, in or out of the army, is black rye bread, and here I venture an observation that may perhaps evoke a smile. The dejecta in a Russian camp are less offensive than those of a beef-eating army, owing to the presence therein of but a small portion of animal matter. The bacilli and microbes bred from these vegetable dejecta I believe less numerous and less dangerous than those from a diet whose chief constituent is meat. In no other way can I explain the absence of epidemics of camp diseases in the crowded and unsanitary camps. No beef-eating army would have survived a three weeks' camp at Haicheng, where large bodies of troops were constantly camping, and where, like everywhere else in Manchuria, flies were a terrible pest, and where occasional downpours spread the contents of the sinks over the entire plain. Yet there was little, if any, camp disease—certainly no epidemic.

Nor are the surroundings of Russian peasant life calculated to develop high-strung nerves. The Russian soldier is not much bothered by nerves. While the Japanese soldier is imbued with a certain stoicism, we find in the Russian soldier religious resignation. Religion plays a great part in the Russian army. The officers rely on discipline, coupled with religion, to carry the soldier through his trials. Every regiment has a chaplain. On Sundays and on holidays he brings out his vestments and his little field altar, the regiment forms around him in a hollow square, and he performs divine service, assisted by a choir of soldiers, whose rendering of the beautiful chants of the Orthodox Church is always good and often magnificent. No one who has seen the Russian chaplain lead his regiment to the charge with raised cross—who has seen the surpassing solemnity of the spectacle of a large body of troops standing just outside the fire of a hundred guns with bared heads and chanting their supplications to their Maker before moving into action—no one who has witnessed such scenes will deny that the Russian officer is right. The Russian soldier is brave—partly because he is nautrally brave, partly because of his inertness, partly because of his religious resignation. No one will deny the steadiness in action that has characterized him wherever he has appeared on the battlefield in past centuries as well as in modern times.

The officer looks upon his soldiers as rude, crude, ignorant children, to be made into useful citizens and defenders of the state. In the absence of compulsory education the army officers are the educators of no small part of the nation. Discipline is not as severe as might be expected and accommodates itself to existing conditions.

The relations that exist between officers and soldiers are perhaps best illustrated by the following: When an officer takes command of his organization, say, for instance, in the morning, before marching, he says to his men, "Good morning, children," and they shout in return, "Good health to your excellency." No general in Manchuria ever passed a detachment of his own troops, however small, without exchanging some such salutation. At his reviews of newly arrived troops at Liaoyang Kuropatkin would address each company on its approach, "I thank you, riflemen," and they would shout back in well-cadenced chorus as they swung past the general, "We are glad to do our best, your excellency." Sometimes a general gains the special love of his soldiers and they then address their favorite as "papasha" (little father).

It goes without saying that the Russian soldier is fine material, but he has one shortcoming—lack of intelligence—that is fatal and prevents his leader from getting the best results from this otherwise good soldier.

The Russian mass was a unit rather than an assembly of units; it was heavy and cumbersome; it was with difficulty set in motion and easily brought to a standstill. The swarms sent forth by the Russian leader despised death as much as their opponents, but he could not control them except as a mass. He could not be sure that there would be intelligent co-operation. He could exact from his men unheard of exertions, but owing to the slow operation of the soldier's mind he could not exalt him to that desperate exertion of what strength remained in him that the Japanese leader could. In spite of his well-known bravery the heavy Russian soldier was vanquished by his brighter and more agile Japanese adversary.

The intelligence, or rather lack of intelligence, of the Russian soldier is commented upon by a general staff officer as follows:

> Of what use is it for the general staff to prepare an ideal system of communication during battle if its organs are blind, if our own soldiers in their ignorance and lack of education interrupt telegraphic and telephonic communications at the critical moment by using the wires for mending their boots or binding bundles of kaoliang? Of what use is the best preparation of a reconnaisance when the greater part of the reconnoitering troops can not distinguish between our own troops—not to mention Japanese troops at all—and when fullfilment of the complicated duties demanded by the theory of war is not to be thought of? Of what use is it to furnish to noncommissioned officers a map which to them is a book with seven seals?
>
> I recall the following occurrence: When our skirmish line had abandoned the village of Laishengpu on February 19, after a bloody contest, the Japanese in the space of twenty or thirty minutes had not only occupied but fortified it, so that the immediate counter attack met with severe resistance The Japanese skirmishers had entered the village at once, had quickly oriented themselves without the help of officers, cut loopholes in the walls of houses with their bayonets and

intrenching tools, and had thrown up trenches. Comrades with machine guns hurried up and then also some officer arrived. The village was permanently occupied. The same thing happened at Linshengpu in the days from October 1 to 5. Such an operation on our part would probably have required the presence of a general staff officer to direct the work and a sapper officer with large details to execute it. And then the paper work would have begun without which we could not have done. It is a sad fact, neither our officers or our soldiers are habituated to the initiative. Nothing is done without orders. (St. Petersburg Zeitung, May 12, 1905.)

NONCOMMISSIONED OFFICERS.

The backbone of an army is its noncommissioned officers, and the value of a high percentage of men of long service among the noncommissioned officers is acknowledged in all armies.

The efforts made by the Government to cause the noncommissioned officers to reenlist have been many within the past thirty years, but the result is as yet unsatisfactory. The pay is too small. In the infantry of the line the first sergeant receives but 24 rubles per year, the sergeant 18, the corporal 4½. In order to induce these men to reenlist the Government has authorized certain bonuses for the first sergeant and two sergeants of each company as follows:

	First sergeant.	Sergeant.
	Rubles	*Rubles.*
For the first year of enlisted service	84	60
For the second year of enlisted service	84	60
For the third year of enlisted service	138	96
For the fourth year of enlisted service	156	108
For the fifth year and all subsequent years	174	120

In addition a bonus of 150 rubles is paid on completion of the first two years of reenlisted service, and of 1,000 rubles after twenty years of reenlisted service. This last bonus, if desired, may be commuted into an annual pension of 97 rubles (36 rubles per year to the widow). Public quarters are furnished to the families of these reenlisted men and they enjoy certain other privileges. After five years of reenlisted service they receive an official letter of recommendation, but they do not thereby acquire a right to employment in the civil service. Other European countries have made the right to employment in the civil service the chief inducement for reenlistment of noncommissioned officers.

THE RUSSIAN INFANTRY.

The Russian infantry differs greatly in organization and character. We find in the Russian army field troops, reserve troops, depot troops, fortress troops, local troops, and militia troops.

The field troops comprise the units of the standing army augmented to war strength by calling in the requisite number of reserve men.

Reserve troops have cadres in time of peace. On mobilization they are filled up with reserve men and become additional units available for field service, and they were so used in the Far East. For instance, the three Siberian infantry divisions of 16 battalions each were mobilized from 3 reserve brigades of 4 battalions each.

Depot troops are also formed from reserve men. The necessary cadre for them is left behind by the troops that move into the field. Depot troops are formed for the purpose of replacing losses in the units in front.

Fortress and local troops are used in fortress and for local purposes only.

To the militia belong all men capable of bearing arms which for one reason or another are not embodied in other units.

The organized infantry may also be divided into the infantry of the guard, grenadiers, infantry of the army, rifles, Cossack infantry, fortress infantry, reserve infantry, and local infantry.

The 12 infantry regiments of the guard form three divisions, the regiment has 4 battalions, the battalions 4 companies. These regiments are not numbered; they have historical or other names.

The 16 grenadier regiments form 4 grenadier divisions. The regiments are numbered from 1 to 16 and have in addition a name of historical or local reference. The organization of the grenadier regiment is the same as in the guards.

The army infantry regiments are numbered from 1 to 180 and formed into 45 divisions, so that the regiments of each division have consecutive numbers. One of the 181 regiments has a name instead of a number. It is really a fortress or local regiment and wears the cinnamon-colored uniform of those troops. The regimental organization is the same as in the guards.

The rifles are more carefully recruited than the army infantry and are supposed to be better trained.

There exist in time of peace the guard rifle brigade of 4 battalions, 2 Caucasian rifle brigades of 4 battalions, 2 Finnish rifle brigades, each of 4 regiments of 2 battalions, 5 European rifle brigades of 4 regiments of 2 battalions, 8 Turkestan rifle brigades of 4 battalions, 9 East Siberian rifle divisions of 4 regiments of 3 battalions.

Cossack infantry.—There are in the Caucasus 6 Kuban-Plastoon battalions recruited from Kuban Cossacks who are too poor to furnish their own horses. There were also 4 Transbaikal Cossack battalions, but they have been converted into cavalry.

Of fortress infantry there are in Russia, 1 regiment of 4 battalions, 17 regiments of 2 battalions, 12 separate battalions of 5 companies.

In Asia, 1 regiment of 2 battalions, 2 regiments of 3 battalions, 1 separate battalion.

The number of companies per battalion varies between 4 and 5.

Reserve infantry.—Of this kind of infantry there exist 25 brigades, variously composed, of whom fourteen expand on mobilization into 2 divisions, one of the first and one of the second category, the remaining 9 reserve brigades expand into as many divisions each of 4 regiments, some of 4, others of 5 battalions.

Local infantry is organized into detachments of varying strength and stationed for garrison duty in remote parts of the Empire, just as our army used to be scattered in the west for the safety of the settlers. There are nearly 150 such detachments, varying in strength from 50 to 500 men.

The infantry company on a war footing is organized as follows:

Officers	4
Officers' servants	4
Litter bearers, cooks, etc	6
First sergeant	1
Quartermaster-sergeant	1
Senior noncommissioned officers (sergeants)	4
Junior noncommissioned officers (corporals)	14
Privates (including 10 lance corporals)	200
Noncombatants	15
Total	249

The quartermaster-sergeant has an assistant (corporal or private) who has special charge of arms and ammunition.

Battalions consist of four companies and are commanded by a lieutenant-colonel, assisted by an adjutant.

The regiment may consist of 2, 3, 4, or 5 battalions. It is commanded by a colonel who, in addition to his other duties, is responsible for the entire administration of the regiment, inspects all regimental funds once a year, and verifies all public property. To his staff belong the following officers and officials:

Officers.—Two extra lieutenant-colonels, the regimental adjutant, the paymaster, the ordnance officer, the judge-advocate.

Officials.—Chief surgeon, chaplain, chief clerk.

One of the two supernumerary lieutenant-colonels is available as assistant to the regimental commander in superintending the training, etc., of the troops. The other supernumerary lieutenant-colonel superintends the regimental administration and his duties are quite extensive, as all clothing is made up in regimental shops from the raw materials furnished by the intendance.

The clothing and equipments for the reserve men, which are to be called to the regiment in time of war, are also under his charge.

The functions of the regimental adjutant are the same as in our own service.

The regimental paymaster is responsible for all funds and is directly accountable for the clothing and equipment.

The ordnance officer handles the arms and ammunition of the regiment, has charge of the target range and armorers' shop. In the field he commands the first echelon of the regimental train and supervises the issue of ammunition.

Of the officials the regimental surgeon is the sanitary inspector of the regiment and the head of the medical service and personnel of the regiment. The chaplain's functions need no explanation. The chief clerk conducts the business correspondence and keeps the books of the lieutenant-colonel charged with the regimental administration.

In addition there are certain offices to which officers are detailed from the regiment. The regimental quartermaster has charge of subsistence, fuel, forage, furniture, etc. The hospital officer superintends the administration (not medical) of the hospitals. We might call him quartermaster and commissary of the hospital.

The following table gives the war strength organization of the European 4-battalion regiment and of the East Siberian Rifle Regiment of three battalions.

	Regiment of four battalions.	East Siberian rifle regiment of three battalions.
Regimental commander	1	1
Lieutenant-colonel commanding battalions	4	3
Lieutenant-colonel, supernumerary	2	2
Regimental and battalion adjutants (subaltern)	5	4
Paymaster (subaltern)	1	1
Ordnance officer (subaltern)	1	1
Judge-advocate (subaltern)	1	1
Company commanders	[a] 17	[a] 13
Company officers	47	28
Officers	79	54
Medical officers	5	4
Chaplain	1	1
Chief clerk	1	1
Officials	7	6
First sergeants	[b] 17	[b] 13
Quartermaster sergeants	[c] 19	[c] 15
Senior noncommissioned officers	64	48
Junior noncommissioned officers	225	168
Noncommissioned officers of train (mounted)	5	4
Noncommissioned officers	330	248
Lance corporals	320	240
Privates, armed	2,880	2,160
Privates, unarmed	240	180
Lance corporals and privates	3,440	2,580
Regimental staff trumpeters	2	1
Trumpeters	....	24
Drummers	32	....
Band	35	35
Musicians	69	60
Clerks	10	8
Hospital soldiers (including 1 veterinary)	30	23
Sexton	1	1
Armorer	1	1
Cutter	1	1
Tradesmen	19	15
Train soldiers	91	284
Noncombatants	153	333
Saddle horses	8	7
Draft horses	127	[d] 281
Spare horses	13	28
Total horses	148	316

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[a] Includes captain of train company.
[b] Includes first sergeant of train company.
[c] One for each company and train company, 1 for baymaster, 1 for ordnance officer.
[d] Including divisional section of train.

It appears from this table that the regiment is a lumbering big establishment, and it is not to be supposed that any but financial reasons are responsible for the size of the regiment. The more officers to a given number of men the better the service may be expected to be, because so many more eyes are watching it. Officers, however, are an expensive article, and the governments maintaining large conscript armies try to get along with as few officers as possible. If we double the strength of our infantry companies without increase in the number of officers, we shall still have about twice as many officers to a given number of men as the Russian infantry.

The train of the regiment practically constitutes a separate company.

There are in addition in each regiment specially trained orderlies and scouts.

In 1886 the so-called "hunting detachments" were first organized in the Russian infantry. The idea was to give the strongest, boldest men of the command a special training that would fit them for scouting and all enterprises requiring boldness, resourcefulness, and perseverance. One of the means employed for their training was the hunting of wild beasts. Under the regulations of 1904 each company furnished four men who were assembled in a detachment twice a week for instruction under an experienced officer in scouting, forced marches, night marches, transmission of orders, gymnastics, fencing, swimming, use of snowshoes, bicycles, rowing and sailing, fishing, and horsemanship.

In 1895 a new regulation directed that in each regiment 12 men should be specially trained as dispatch carriers (mounted orderlies) who were to be assigned for duty as follows: Eight to corps commanders, 1 from each regiment; 16 to division commanders, each 8, 2 from each regiment of his division; 8 to brigade commanders, each 2, 1 from each regiment of brigade; 32 to regimental commanders, each 4, 1 from each battalion, 32 to battalion commanders, each 1 from his battalion, a total of 96. These men were to be mounted on condemned cavalry horses.

In the war in the Far East these men were found so useful that in the rifle regiment 10 men per company were mounted and made into mounted scouts and orderlies. This gave a company of 120 men. In the first place, it gave at least one mounted orderly for every officer from the battalion commander up. What that means those know best who in war or maneuvers were mounted officers and were compelled to dismount for the performance of some duty without having a mounted orderly with them. In the Far East it was rare to see a mounted officer without a mounted orderly; the addition of the mounted orderly greatly increases the efficiency of the mounted officer. In the field this mounted infantry command is available for scouting duty, and where cavalry was absent was, of course, invaluable. In the first place, these men on coming in contact with the enemy promptly went forward to reconnoiter him, to engage his advanced troops, and, in the second place, the information gained was promptly put in possession of the troops in rear. These men led in all dangerous enterprises, night attacks, etc., and I have seen them reconnoiter part of the enemy's position under protection of their artillery in rear; they rode just behind the shrapnel of their own artillery. For the transmission of orders, for scouting, as mounted orderlies for officers, they were invaluable.

To observe movements of troops or an action, it is always necessary to occupy some high, commanding point. The character of this height will frequently make it necessary to leave the horses at the foot, and on account of the enemy's shrapnel it is never advisable to appear on a hill mounted, both because a mounted group can be seen a long distance and because it offers a large target. Near Pienniulupu, where we were riding with General Stackelberg over the position, horses were wounded by rifle bullets at a range of 2,000 yards, though the exposure of the target was very brief. The long ranges of the present battlefield compel the use of at least the field glass, if not the telescope. Even on a specially trained horse the use of the field glass is difficult, and it is not by any means easier when the officer has dismounted and has the bridle over his arm and the horse gives him a jerk every time a shrapnel bursts in the vicinity. There are many occasions when an officer is required to dismount in the performance of his duties. I consider this arrangement of mounted scouts and orderlies a most useful one from every point of view.

The regulations lay down the following transportation for the four-battalion regiment: 16 one-horse ammunition carts

6,000 rounds each), one for each company; 8 two-horse ammunition carts (14,400 rounds each); 4 one-horse carts for medicines and dressings, 1 one-horse cart for stretchers, 4 four-horse ambulances, 6 one-horse baggage carts for regimental and battalion staffs, 32 two-horse company baggage wagons, 6 two-horse regimental baggage wagons, 14 spare horses, 16 field kitchens.

I frequently attempted to ascertain the exact composition of the regimental transport of the East Siberian rifle regiments by counting the carts, but never with the same result, the carts varying from 50 to 75 and more. I never saw ambulances or wagons in the regimental baggage.

The company ammunition carts, the medical carts, and the field kitchens, and frequently the officers' baggage also, formed the first echelon, marching immediately in rear of the regiment, while the rest followed at a greater distance. In numerous instances Chinese carts accompanied the column.

THE BRIGADE.

The next higher unit of the infantry is the brigade of two regiments. It is a tactical command and has nothing to do with the administration. On the latter point the regiments communicate direct with the division. The staff of the brigade thus simply consists of the major-general commanding the brigade, his adjutant, and clerk.

THE DIVISION.

The division is the next higher unit and consists of two infantry brigades with artillery parks, train, technical troops, etc. It is a tactical as well as an administrative unit.

UNIFORM AND EQUIPMENT.

The ordinary uniform of the Russian infantry man consists of a round cap without visor, a dark-green double-breasted blouse which is worn loose and is fastened with hooks and eyes, has stand-up collar and shoulder straps. The trousers are of the same color and material as the coat and are worn very loose. For foot gear the Russian soldier wears a boot that comes up to the knee. His overcoat is a grayish brown ulster reaching below the knees. It is so wide that a sheepskin coat can be worn underneath it in very cold weather. This sheepskin coat is worn with the wool inside and reaches to the knees. Instead of stockings the soldier uses foot cloths.

In Manchuria the uniform was somewhat modified during the warm season; the blouse was done away with and in its place was worn a shirt outside the trousers. The color was not uniform. The prevailing color was gray; and the soldier also received a gray cover for his cap. This helped to make him less conspicuous. The long boot was no doubt most uncomfortable in the summer, but it struck me as a good thing on the heavy, muddy roads. It no doubt affords to the leg better protection from the cold during the severe winter than our canvas leggings.

The Japanese army wore khaki uniforms, which made them very inconspicuous.

The equipment of the infantry soldier consists of a waist belt of buff leather, supporting a pouch for 30 rounds on each side of the clasp, and a Linnemann spade on the right side in a case, handle downward. A bandolier holding 30 rounds is carried over the left shoulder under the overcoat roll, and another pouch with 30 rounds is suspended by a strap over the right shoulder and fastened to the waist belt on the left side. Suspended over the right shoulder and hanging in rear of the left side is a canvas knapsack, which has canvas straps attached to the lower inner corners which are fastened around the waist, causing the top of the knapsack to tilt backward. This knapsack is supposed to contain 2 shirts, 1 pair of drawers, 2 pairs of foot cloths, 1 towel, 1 pair of mittens, 4½ pounds of biscuits in two bags, some salt, cleaning material, sewing kit, and small drinking cup. The canteen is of aluminum, German pattern, with felt cover. It is suspended over the right shoulder and very light. The overcoat is rolled and worn over the left shoulder. To its rear half is strapped the folded shelter half and an extra pair of boots, and the aluminum mess tin is pulled over the lower end of the roll and fastened to it. This aluminum mess tin is about 7 inches in diameter at the bottom and 6 at the top, and 5 or 6 inches high. I saw many similar mess tins of copper, evidently an older type. Few of the soldiers had leather bayonet scabbards; most soldiers had none; as the bayonet is always fixed (except when mounted) there is little need for a scabbard. The shelter tent consists of 6 sheets, 3 jointed poles, 10 ropes, and 8 pegs, and the equipment is divided among 6 men. The sheets of the shelter tent are 97.75 inches square.

The knapsack is supposed to be pulled up close under the left shoulder. At Mukden I saw troops arriving from Russia with entirely new equipments and arms. They had so many things and such bulky things slung over their shoulders that one wondered they could move at all.

The shelter tents are larger than our own and no provision is made for closing the back of the tent. The tent differs from ours also in this that an indefinite number of parts can be combined into all sorts of tents, and the sheets are laced, not buttoned together.

There is nothing in the equipment of the Russian infantryman that rattles. Each infantry company has 80 Linnemann spades and 20 light axes carried by the men; the remainder of the tools of each company—viz, 16 heavy spades, 8 heavy axes, 3 mattocks, 3 pickaxes, and 1 crowbar—are carried in the division train. This gives for a four-battalion regiment 1,280 light and 256 heavy spades, 320 light and 128 heavy axes, 48 mattocks, 48 pickaxes, and 16 crowbars. In addition each company carries two hand litters.

THE RATION.

The ration of the soldier consists of bread, 2 pounds 4 ounces, or biscuit, 1 pound 9 ounces; fresh meat, 14 ounces, or preserved or salt meat, 10 ounces; salt, 1⅜ ounces; vegetables, 9 ounces, fresh, or ⅜ ounces, dried; butter or fat, ¾ ounces; ground meal, ⅜ ounces; tea, ⅛ ounces; sugar, 1½ ounces; pepper, ¼ ounces.

In addition a corps commander may order the issue of a daily allowance of whisky, vinegar, and citric acid. The Russians are fond of adding a slice of lemon or a little citric acid to their tea.

Officers have ration allowances which are paid in cash and are doubled in the field. When the circumstances are such that officers can not subsist themselves they receive a gratuitous issue of the soldier's ration with the addition of 1 pound of meat and some brandy.

The mess utensils of the soldier are his mess tin and a wooden spoon (usually carried in the boot leg). Each company of infantry has a field kitchen on wheels. It consists of a boiler mounted on an axle with fire box and chimney. This constitutes the piece as it were, and is attached in a corresponding manner to a limber on which is the driver's seat, being a box in which are stored kitchen utensils and articles of the ration. Each field kitchen has a short, two-handled crosscut saw for sawing logs. On the back of the driver's box is a small rack for kindling. These wagons are part of the first line of baggage and follow the regiment, one for each company. The lid of the boiler can be fastened down air-tight, so that the contents can be cooked under considerable steam pressure and without loss of heat or of fluid. When the regiment arrives in camp the principal meal of the day is ready cooked, and it is not bad either. There is a separate compartment in the boiler for hot water, which may be drawn by a spigot. Not only does this kitchen wagon furnish meals ready on arrival in camp, but it saves much work otherwise. The wagon drives to the river or well to be filled with water, and if the company is distributed in detachments the field kitchen comes driving along and ladles out steaming suppers and furnishes boiling water for tea. The lighter kind of soup kitchen is hauled by two horses, the heavier by four. On the march when the regiment halts in the middle of the day the kitchen battery drives up, each wagon halting alongside its company. In a very short time the men have had their meals and are ready to go on so far as eating is concerned. When going into camp in the evening the cook needs no fatigue party to hunt for water and wood; the cooked meal arrives simultaneously with the troops, and if anyone is needed to go for wood—the wagon always drives to the water—he needs not go until he has had his supper and some rest. A further result of this institution is that the meals are thoroughly cooked. This is of the utmost importance in the field, and the remarkably sanitary statistics of the Russian army may no doubt be largely attributed to this field kitchen and to the universal use of hot tea. It is useless to enlarge further on the advantages of this article of equipment, which I believe will become indispensable in the field wherever introduced.

At the battle of Telissu and on other occasions I saw the field kitchens with steaming dinners stand at the foot of the reverse slope of the position, not far from the ammunition carts, while the regiment was hotly engaged on the front slope. A lull in the battle could be utilized to fill the soldier's stomach with a hot meal and restore his stomach for fighting. While thus a ready meal was at hand for the soldier, a change of position never entailed the loss of the ration articles in process of cooking. The cook simply mounted the driver's seat and drove on.

This field kitchen is not used in garrison where an ordinary kitchen takes its place. In the field it is simply invaluable. The soldier's cooking is done for him, and the occasions are extraordinary when he has to cook for himself. The meals, particularly the meat, are thoroughly cooked. The full nutritive value of all the meat, including the bone, is gotten out of it. It seems to be a general custom in the Russian army in the field to have meat in the soup, a generous piece for each man.

The Russians themselves admired their field kitchens. I do not believe that an officer or soldier could have been found willing to part with them. I conversed with officers of all grades about their traveling kitchen and they were all enthusiastic about it.

The beef of the Russian soldier was driven along on the hoof and was always good while I was there, and his bread was baked in divisional field bakeries. The principal food of the Russian peasantry is black rye bread, baked, I believe, of unbolted flour, and the Russian soldier would much rather do without meat than lose part of his bread or biscuit ration. This bread in itself with a little salt furnishes a sufficient meal. There is no craving for fat in connection with it, as is the case with our wheat bread. A hungry man may stuff his stomach with the latter until he can hold no more, but he has not the feeling of a satisfied appetite. I was very fond of this Russian black bread, and missed it as much as the Russian soldier when the railroad brought no more rye flour from Siberia and Russia and the wheat flour of the Harbin mills was used for the army.

The soldier carries his own bread or biscuit. The latter is prepared by simply breaking the loaf of bread into pieces and baking it over again. When the soldiers were unable to eat their bread fast enough to keep it from spoiling they cut it into slices and made it into biscuit by drying it in the sun.

Rye bread forms a strong rind over the loaf which keeps it moist a long time; for the same reason the biscuit becomes exceedingly hard. It becomes so hard that it can be packed and handled without damage in sacks. It does not crumble readily in the haversack, and it tastes much more like Russian bread than our hard-tack tastes like wheat bread.

It will be noticed that the Russian soldier does not receive coffee with his ration. The national beverage is tea, and it is a very good substitute. It is more easily carried than coffee, needs no roasting or grinding, and requires no skill for its preparation.

When the water boils the tea is dropped in and the kettle immediately taken off the fire. In a few minutes it is ready for use. Both in hot and cold weather it is a most refreshing beverage. The tea issued to the army is compressed in slabs that are very hard and the quality is light, so that a little too much boiling does not result in a decoction of tannic acid, as is the case with better brands of tea when boiled or steeped too long.

I consider the provisions made for the feeding of the Russian soldier in every way satisfactory.

AMMUNITION SUPPLY.

Ammunition is provided as follows:

Carried by the men	rounds per rifle..	120
In regimental ammunition carts	do....	66
In artillery flying parks	do....	72
In local parks	do....	170
Total		428

Each man carries 120 rounds on his person. A reserve supply is carried on the company ammunition cart, which is drawn by one horse and holds 6,000 rounds done up in zinc cases of 300 rounds each. These zinc cases have their tops soldered on in the manner of a tin of biscuits and the top is pulled off by taking hold of its free end. Their weight and volume make the packages handy. The ammunition carried in these carts and in the regimental ammunition carts, which are drawn by two horses and hold 14,400 rounds, are under the charge of the regimental ordnance officer. When his regiment assumes battle formation he is given general instructions, depending on the ground and on the course of the action, where he is to take post with his ammunition carts. They should never be farther to the rear than the regimental reserve, and where there is good cover, to the rear of the battalion reserves. In case of a defensive action they may be nearer.

The ordnance officer, having posted his ammunition carts where they are protected from the enemy's fire, reports their location to the regimental and battalion commanders and remains with his carts throughout the action, prepared to honor promptly any demand for ammunition. He is expected to change the position of the ammunition to the front or rear on his own responsibility, depending on the course of the action. He must be on hand promptly whenever ammunition is wanted. Each ammunition cart is distinguished by a small red flag, and the position of the carts are marked by a red flag in daytime and at night by a green lantern planted slightly away from the carts.

When the action is a defensive one, part of the ammunition may be turned over to the troops or deposited in suitable places in rear of the firing line, in which latter case the troop commanders will have to see that it reaches the front. This I saw done at Liaoyang. The ammunition was deposited in a safe place, on the reverse slope, for instance, or in a village in rear of the trench, and every once in a while three or four men would carry packages to the trenches. In neither case was the distance over 200 yards. When the troops leave their position and move forward to the attack, the ordnance officer must see that all loose ammunition left in the position is carefully collected.

As regards the ammunition supply of an attacking force, the Russian regulations state that it seems inadvisable to load the men down prematurely with reserve ammunition, and that on the other hand it will be impracticable to hold the ammunition carts near the fighting line. It is therefore recommended that when within 1,400 to 1,000 paces of the enemy the ammunition supply of the firing line and reserve should be replenished and some extra ammunition given out to the skirmish line. This I never saw done. It may have been practicable sometimes under cover of the high crops or of a ridge in front, but on open ground the practicability of this provision of the regulations seems to me doubtful. These regulations continue: "A sparing use of ammunition, particularly at the long ranges, is considered the best safeguard for having on hand sufficient ammunition to the end of the action."

All in authority on the firing line are required to know at all times the approximate number of cartridges still on hand and to take steps to replenish same before they are all expended. They must likewise see that the ammunition of the killed and wounded is collected.

When ammunition is required at the front, the officer sends two or three men to the reserve, and if the ammunition carts are near the reserve they get the ammunition direct from the carts; otherwise the reserve at once turns over half of their own ammunition and furnishes enough additional men to carry it, replenishing their own ammunition from the carts. The men carry loose ammunition in sacks, bashlicks, or the skirts of their overcoats or in any other handy way, and the men who go forward with the ammunition report to the nearest officer there and remain in the firing line.

When troops are short of ammunition they may demand it from any ammunition carts, no matter whose, and it will be furnished. No requisition or receipts are required. The noncommissioned officer in charge of the cart simply notes the number of rounds furnished and to what organization. Immediately after the action the first care is to ascertain the amount of ammunition on hand. At Liaoyang the Thirty-fourth East Siberian Rifle Regiment expended nearly 1½ millions of rounds in three nights and two days.

As regards open-order fighting and the infantry attack the Russian Drill Regulations demand that the recruit be carefully instructed on varying ground against an enemy outlined by old soldiers firing blank cartridges. The use of cover is strictly enjoined, and the soldier must place himself where he can see the enemy.

In the attack great stress is laid on the desirability of having the men as fresh as possible at the moment when they cross bayonets with the enemy. Altogether the Russians lay great stress on the bayonet and they carry their argument to its logical conclusion, for the bayonet of the Russian infantry is always fixed. It is therefore prescribed that the skirmish line advance at a walk only. If it is necessary to use rushes then the men must rise promptly and altogether, as otherwise they give notice to the enemy and enable him to fire on them by the time all are up.

A Russian company acting alone may deploy one, two, or three platoons, but always keeps one in reserve, and supports are not provided for in that case. A battalion deploys entire companies without company reserves. It is only when we come to the regiment that we find the fighting line consisting of three lines—i. e., the firing line proper, the battalion reserves, and the regimental reserves—and when we come to the division there is, in addition, a general reserve.

Regarding distances, it is laid down that the distance between the firing line and the nearest reserve must always be less than that between the firing line and the enemy, and it is stated, for instance, when the firing line is 1,200 paces from the enemy the maximum distance to the battalion and regimental reserves should not be more than 500 and 1,000 paces, respectively.

FIRING.

On many occasions I heard Russian officers speak of the wild, ineffective, rapid fire of the Japanese infantry, and since my return from the seat of war I have heard attributed to the Japanese similar remarks about the fire of the Russian infantry.

The arm of the Russian infantry is the three-line rifle, model 1891 (caliber 0.299 inch), having an initial velocity of 2,034 feet and sighted up to 3,000 paces.

The ballistic qualities do not materially differ from those of the ordinary modern small caliber rifle; still in initial velocity and flatness of trajectory the Japanese rifle is superior to the Russian. When the magazine is empty the rifle may be used as a single loader.

In battle the firing may be individual firing or volley firing; it may be slow or rapid (with counted cartridges, each man firing away one clip, five rounds, called packet fire). Rapid (individual) fire is chiefly used at the short ranges preparatory to the final assault. Volley firing on the firing line is by platoon. The regulations state that this kind of fire may be used at any range, particularly against large targets, but should not be used unless the circumstances are such that the command can be easily heard. Firing while in motion is prohibited. Fire is never opened without command; the platoon commanders designate the range and the target and regulate the rate of fire.

Nearly all the firing I saw was by volley.

INTRENCHMENTS.

The Russian troops were invariably intrenched and their trenches were heavily manned; as many were generally put into the trenches as they would hold.

Wherever practicable the standing trench was employed as being the best protection against shrapnel fire. The kneeling trench was not employed unless lack of time or the character of the ground made the standing trench impracticable. The lying-down trench I never saw. In rear of the army the labor of intrenching was done by paid Chinese coolies; at the front the troops did the work. In the First Siberian Corps and in the East Detachment the senior sapper laid out the work; the troops furnished the labor, the sapper officers superintended it, and for each company working in the trenches the sapper battalion detailed four men, who directed the work and saw that the dimensions, etc., of the work were correct. The trenches were constructed on the military crest and generally disguised. At Anshantien the trenches of the outpost brigade west of the railroad were constructed just inside kaoliang fields, and in some instances kaoliang had been planted on the superior slopes. In the main position the trenches were not disguised and the streaks of excavated yellow earth marking the trenches were visible a long way. When the commanding general caused the trenches to be manned the troops immediately gathered grass and grain from the fields and covered the excavated earth. At Liaoyang little, if any, attempts had been made to disguise the trenches.

The reverse slopes of the position at Liaoyang were very steep, but were nevertheless thoroughly searched by the

Japanese shells. Here the emplacements for the local reserves had been constructed on the steepest slopes, and well it was that their sites were well selected. The low knoll just west of the Mandarin road and the two outlying knolls of the principal hills farther east were each encircled by a trench returning on itself, forming a sort of flat redoubt with strong splinter proofs on the rear face and approaches through a gully from the rear.

In the fortifications of Fuling, on the right bank of the Hun River, troups de loup and abattis were used. At the village of Fuling there is an interval of 600 to 800 yards of flat ground between the river and the hills, and here the fortifications were constructed on the plain and a liberal use of abattis was made. Farther east, where the river more closely approaches the hills, the trenches were constructed on the first crest. Much of this work was just inside the edge of the woods, and here, as well as where the trenches were in the open, the freshly turned earth had been sodded with great care and parts of the river had been made unfordable by throwing in quantities of branches of trees. Except for the crops the country on the opposite bank was open and flat and the intrenchments had a command over the river varying from 50 to 75 feet.

Later on, when the opposing armies came to a rest after the battle on the Sha River, in October, both intrenched themselves prodigiously. On the Russian side in the position of the East Detachment every hill was encircled by a flat redoubt provided with approaches from the rear and successive lines of fortifications. Sometimes five or six were constructed and strengthened with troups de loup, wire entanglements, abattis, etc. Wagon train after wagon train arrived at Kangtolishan loaded with two-stranded barbed steel wire. The winter quarters for the men were constructed just behind the works they were to defend.

The character of shrapnel is such that the lying-down trench provides cover against it only, but not shelter. The man who lies down converts his vertical target into a horizontal one, but does not diminish it, and if his presence is known or suspected by the opponent's artillery he will not derive much advantage from the lying-down trench. So far as I can see, the usefulness of this trench is limited to the infantry on the offensive, which has been checked and must hold out under the enemy's fire. Cases of this kind are mos likely to occur in the infantry attack in battle. When th enemy's position is a strong one the attack may last for days as they did west and southwest of Shoushan Hill in the battl of Liaoyang. Here the Japanese infantry remained for forty eight hours in close proximity to the Russian trenches and th fire never entirely ceased after it had once begun.

The Russians were in standing trenches; the Japanese wer in front of them at distances varying from 200 to 400 yards An essential factor here was the high crops, which extended t within 200 yards of the Russian trenches and effectively concealed the Japanese infantry.

According to the theory of battle the attacker should in the first place silence the opponent's artillery. He then covers the defender's trenches with fire, and thus enables his own infantry to advance without undue loss to the position whence the final assault is to be launched. In order to be able to withstand this artillery fire and enable his infantry to repulse the attacker's infantry, the general on the defensive must provide effective shelter for his men. The effect of shrapnel fire is so searching, so murderous, that this precaution is imperative. It may be truthfully said of the Russians, and probably of the Japanese also, that when they did not march or fight they dug. The best protection against shrapnel fire is the standing trench, as it reduces the man's target to a minimum, and this trench was the invariable rule among the Russian troops which I saw. The kneeling trench was the exception, and I saw it only on rocky ground, which opposed great difficulties to deeper trenches.

The Japanese generally prepared every attack by an artillery bombardment. On the second day of the battle of Liaoyang (August 31, 1904) they prepared the last attack in the evening by a bombardment from a number of guns, which I estimated at close to 250. Without substantial trenches the Russian infantry could not have remained in the position without being annihilated by this terrible fire. As the position was a range of hills, the Russian infantry would at the very least have been driven to hug the reverse slope, where, being without trenches, they would have suffered heavy losses. Supposing they had done so, the Japanese infantry could have ascended the front slope almost unopposed, for the position rose in bold relief from the south, and the artillery could have maintained its fire almost until its infantry was ready to occupy the crest. As it was, the Russian infantry was enabled to remain in its position and show such a firm attitude that the Japanese attack came largely to a standstill at the edge of the grain fields at the foot of the hills. To fully appreciate the necessity of trenches one must have seen the terrible bombardment to which the position was subjected.

MARCHING.

The marching power of the Russian soldier is good, but he is badly handicapped by the bulk and weight of his equipments. His heavy boots may be left out of consideration, for he wears them all his life, in or out of the military service. In the latter part of June and in July a tremendous amount of marching was required of the troops posted along the railroad. It was the hottest part of the year and the wettest. The heat was severe and the atmosphere humid, just like in midsummer in the city of Washington. The roads were bottomless and sometimes impassable for short times. In China or Manchuria no one gives any care to the road, the particles of the soil loosened by the wheels of wagons or hoofs of animals are blown away by wind or washed away by rain, ruts cut by wagons are never mended, and in a comparatively short time the level of the road sinks below that of the adjoining fields. The older the road the deeper it is cut into the ground. During the heavy summer rains the roads became raging rivers and more than one Russian soldier was drowned in trying to cross them. On the retreat from Anshantien to Liaoyang and from there to Mukden the marches were not very long, but the heavy roads broke up all semblance of formation. As a general rule the wagons marched on the road and the troops anywhere else—across country, if practicable—so that sometimes five or six columns could be seen marching abreast. Both in consequence of the bad roads and of the load he carried the march of the Russian soldier was slow; well closed up columns were rare, yet I did not see much straggling.

NOTES ON ARTILLERY.

The Russian artillery was armed with a new 3-inch field-piece—quick firing, with long recoil arrangement and spade at the trail. The gun rests in a cradle fastened to a steel plate provided underneath on each side with a groove which fitted over a T-shaped rail on top of the forward part of the trail. Fastened underneath to the steel plate was the end of a strong rubber cylinder whose other end was fastened near the spade. This rubber cylinder was strengthened with steel rings every 3 or 4 inches and had guides preventing its swerving from the plane of its axis under the force of the recoil. In addition there was a hydraulic recoil arrangement. The powder charge and projectile were combined in one cartridge, and shrapnel weighing 14 pounds and containing 260 bullets was the only projectile used. The fuse was of aluminum and graduated up to 6,040 yards, the scale being divided into 130 equal parts, each representing 20 sashen, or 140 feet. The initial velocity was nearly 2,000 feet. It is a powerful piece of ordnance, but its heavy weight told against it on the bottomless roads of the plains and the rugged trails of the hills. Field and horse artillery used the same gun, the field battery having 8, the horse battery 6 guns. The battery was commanded by a lieutenant-colonel. The European Army Corps has two artillery brigades, one for each division, one of 6 the other of 8 batteries. The Siberian Corps had a brigade of 4 batteries to each division. It will be observed that neither the Russians nor the Japanese had corps artillery, while on the other hand we find with the Japanese two artillery brigades of 18 batteries each, which partake of the character of an artillery reserve and whose concentrated fire silenced two intrenched Russian batteries at Telissu in fifteen minutes.

The Japanese invariably made sure of having an overwhelming number of guns to bear on the point of attack. The troops had their own batteries—36 guns to a division—and it was only necessary to bring in one of the artillery brigades to have a most decisive superiority of fire. The direction of the fire on the part of the Japanese was admirable and their gunnery generally excellent, but their shrapnel often burst high and thus failed to yield the best results. The Japanese gun was lighter than the Russian and outranged by the latter by more than a thousand yards, but this defect was more than overbalanced by the crushing numerical superiority in guns. Wherever practicable the Japanese assembled many guns in large batteries and with their fire covered the Russian position, its reverse slopes, as well as the ground in rear for some distance. The high angle of fall of the Japanese projectile at long range made it necessary on the Russian side to construct the emplacements for the local reserves along the steepest portions of the reserve slopes which in many instances were cut away to the vertical.

The Russians fighting generally on the defensive, their guns were distributed according to the requirements of the position. Thus at Liaoyang the batteries of the First Siberian Corps were distributed in groups of two batteries. At Telissu the Russians, acting under antiquated tactical notions, had intrenched some batteries in the center on a conspicuous hill, whereas the Japanese batteries made themselves as inconspicuous as possible. The Russians here learned a lesson and thereafter their guns were concealed or disguised. Wherever there was a good point of observation nearby, the guns were placed behind cover and indirect fire was used. At Liaoyang two batteries of the First Siberian Corps stood on perfectly open ground in front of Shoushan Hill and small shelters had been dug for the men; 700 yards in front was a low round hill intrenched for infantry, which hid the batteries from view. Immediately in rear of the batteries rose Shoushan Hill, and some distance up the slope was a Russian artillery colonel with an observing party who regulated the fire of the batteries below by means of a megaphone. Though standing perfectly in the open, these two batteries did not suffer much, simply because the enemy's guns did not find them in spite of a furious bombardment. As the war progressed, indirect fire was more and more relied on on both sides. Every Russian battery had a portable telephone and perhaps a mile of cable. I recall an instance where a Russian artillery general sat on a hill over 1,000 feet high with one battery south and three batteries north of the hill and directed their fire from his station by telephone.

In the semi-permanent defenses of Liaoyang, as well as in the fortified positions on the Sha River, the emplacements for artillery were generally some distance in rear of the infantry.

lines. This was not without an element of danger, for the sides of the Russian shrapnel were evidently unequal to the strain and many burst in the barrel or a short distance in front of it. At any rate, the premature burst was generally attributed to the shell and not to the fuse.

For gun pits the Russians used various patterns. When direct fire only could be used, they were sometimes cut in an existing natural bank in the form of a rectangular excavation open in rear. Two such emplacements I saw at Anshantien. On elevated ground circular pits with vertical walls were dug behind the crest, the muzzle just clearing it, the spade jammed against the back and the wheels against the front of the pit. In this last case (in the positions of the East Detachment on the Sha River) splinter proofs were provided on either side of the gun, invisible from the front. Here the gun detachments practically lived, and here also the ammunition was stacked up ready for use. Whenever guns were in position, some twenty-odd cartridges were kept by the side of each gun in order to be able on appropriate occasion to make full use of the quick firing character of the piece. Four caissons remained with the fighting battery, which, with the limber ammunition, gave a first supply of 84 rounds per gun. The distance of the ammunition column in rear depends on the ground, as did the position of the limbers and caissons. At Liaoyang the ammunition column was 1 mile in rear of the batteries, and the caissons, generally in groups of three, traveled to and fro all day between the batteries and the ammunition column. In that battle the 150 guns of the First and Third Siberian Corps expended 108,000 shrapnel or 720 rounds per gun. The cartridges are packed in steel trays holding four each and provided with handles which make them convenient to carry.

When a corps goes into position, the corps commander gives instructions to his chief of artillery. He assigns to the divisional artillery chiefs their positions and targets in a general way. The latter proceed to their positions and are joined by the battery commanders, to whom they assign their positions and targets. The batteries are then brought up by the senior captain from a rendezvous position in rear. The fire rests altogether in the hands of the artillery commanders, and division commanders interfere only when sudden changes or contingencies make it imperative.

The shrapnel is a murderous projectile, and this circumstance, coupled with its long range, made the maneuvering of troops within artillery range very dangerous in the absence of cover. Where no natural cover is obtainable artificial shelter must be provided, and for that purpose the standing trench is the best. The same consideration has led to the frequent use of night attacks and to the hiding of troops. The intelligent use of the ground is a necessity. The importance of artillery has powerfully increased. Not only is the shrapnel a most effective projectile, but the long range of the guns makes possible a concentrated cross fire on a position that one must have seen to realize its power. The last attack on First Siberian Corps at Liaoyang on August 31, 1904, is an example.

The Japanese used quite a proportion of high explosive shell in preparing an infantry attack, and they seemed to be intended for animate and inanimate objectives alike. On October 27, 1904, the Japanese artillery fired a greater proportion of high explosive shell against the Russian trenches on Temple Hill than I saw anywhere else, and I was told that the Russian losses of 60 killed and 340 wounded was chiefly due to the high explosive shell. The Russians did not use high explosive shell. A colonel of the general staff told me once that the Russians ought to have them if for no other purpose than that of ranging. In finding the range the Russians seemed to rely solely on the observation of the burst of the shrapnel in the air.

The war in the Far East has fully brought out the power of modern artillery.

The searching effect of the shrapnel compels the defense to resort to very substantial trenches. The long range of the guns enables the attacker to concentrate on a given point the fire of many guns without change of position, and the greater this front of artillery the more searching will be its fire. The rapidity of fire of which the modern field gun is capable makes possible an intensity of fire never witnessed in any previous war.

The power of artillery being so great it would be foolish indeed for a government not to avail itself of the advantage thus offered, and I believe that as a result of this war there will develop everywhere a tendency to relatively increase rather than to decrease the proportion of artillery and its supply of ammunition. A nation that enters to-day upon war with palpable inferiority in artillery incurs the gravest risks.

To derive the full benefit from artillery it is necessary that it be properly organized and trained. All artillery officers, without exception, should be instructed at artillery firing schools where they can see the effect of this fire under various conditions and become thoroughly practical gunners. In the field, artillery must cease to be a scientific arm pure and simple. The scientific officer, who is at the same time a thoroughly practical gunner, is the ideal artillery officer. If he is a thoroughly practical gunner without being scientific he is immeasurably more useful in the field than the scientific man who is not a practical gunner.

Proper organization is necessary not only for the purpose of instruction and administration at home, but for tactical handling in the field. A unit (the parts of which have worked together in time of peace) will work together in time of war better than a temporary combination of units, each of which has heretofore followed its own idiosyncrasies and must now learn to cooperate with other units and in addition subordinate its action to the directions of the common superior. This is most important in the direction and control of fire in battle. Tactical training in tactical units in time of peace is of the utmost importance not only for the artillery units, but equally so for battalion and higher commanders. After what I have seen in the Far East I am so thoroughly convinced that our present artillery organization, or rather lack of organization, is bound to be a source of weakness that, though not an artillerist, I venture to express the belief that our field artillery stands in need both of a thorough reorganization and of a substantial increase. It is further my belief that we ought to have a large proportion of mountain batteries. The great armies of Europe design their guns with regard to the good roads that abound everywhere, and this condition does not exist anywhere where we are apt to take the field. It is safe to assume, that as a general rule, our roads will be bad rather than good, and while it may be necessary for us to have a piece as heavy and powerful as the European field gun our mountain batteries would confer an immense advantage in a difficult country.

It is utterly unthinkable that our artillery should be able to acquire the skillful control and direction of fire, and the uniformly high average of marksmanship of the Japanese artillery, so long as the present disorganization of our field artillery is not replaced by solid organization.

The war in the Far East, while it has left cavalry its strategic rôle, has closely cemented the bonds between the infantry and artillery. The cavalry hunts the prey, the artillery and infantry overpower it and drink its life blood. By its perfected armament artillery has more nearly reached the tactical importance of infantry. It would be a mistake, however, to assume that these two arms could ever become interchangeable. Modern artillery has impressed its stamp on war, and the infantry fit to fight at its side or against it can no longer be made in three months or even in six.

NOTES ON CAVALRY.

The Russian cavalry I saw, excepting the Primorski Dragoons, consisted solely of Cossacks. All were armed with rifle and sharpened saber; there is not a saber in the Russian army that is not sharp.

The Cossacks were mounted on small but hardy Siberian horses, and the Siberian Cossacks carried the lance in the front rank. In a country unfriendly to an army and swarming with bandits the lance was not without its uses, but on the battlefield itself it was not tested so far as I know.

In the ranks of the Cossacks were also Buriats and other natives of Siberia. Among the officers of the Cossacks there were many young officers from Russia, chiefly from the guard, who had obtained volunteer commissions with increased rank and now commanded Cossack sotnias. Up to the battle of Liaoyang most of the cavalry was operating in a mountainous country very unfavorable for the use of cavalry, and even on the plain the cavalry was largely confined to bottomless roads, because of the high kaoliang fields. The cavalry divisions covered the fronts and flanks of the armies. In the mountains of the Liaotung Peninsula, as well as east and southeast of Liaoyang, they formed the advanced posts toward the enemy, they observed him, they reconnoitered him, they remained in constant touch with him, and they were the first to resist his advance.

The cavalry made a raid into Korea and it seems has made more extensive raids during the winter. General Rennenkampf, who commanded one of the cavalry divisions, is an ardent admirer of Sheridan, whose campaigns he had closely studied. General Mishchenko, originally an artillery officer, had a brigade of cavalry with a horse battery and both he and Rennenkampf remained in contact with the enemy every day during the war. This use of cavalry is in harmony with our American ideas on that subject as crystallized from the experiences of our civil war.

This Cossack cavalry fought on foot whenever it had to fight, and being always in contact with the enemy it lost men steadily. I am not able to state what the strength of a sotnia was by the end of August, 1904. I doubt whether it was as much as a hundred sabers. There are signs that the service of the cavalry was not always satisfactory. Thus at Telissu the cavalry is charged with reporting too late the turning movement of the Japanese left and with allowing the Japanese cavalry to attack the Russian left in the rear. In regard to the latter fact there seems to be no doubt, but with regard to the former I have heard it stated that the cavalry reported the Japanese turning movement promptly. It is a fact that the commander of this cavalry division was sent home in company with one of the brigade commanders. It is also laid at the door of the cavalry that Kuroki's crossing of the Taitzu during the battle of Liaoyang was reported twelve hours too late.

The Russian cavalry has generally been adversely criticised. Outside of the specific shortcomings mentioned I consider that the use of the Russian cavalry, if poor in execution, was correct in principle.

COMMAND AND STAFFS.

The commander of the Russian army is appointed by the Czar and has large power. He is accountable to no one except the commander in chief; he commands all the troops and administration authorities of his army; he may make changes in the organization of his army, make temporary appointments of regimental, brigade, division, and corps commanders and of officials of the administration, and he may remove any of them without regard to rank, and confer certain decorations. As regards supplies for his army his powers are extensive and almost unlimited.

The staff of Kuropatkin's army was organized according to the regulations, consisting of the (1) field staff; (2) administrative staff.

The field staff consists of the chief of staff, the quartermaster-general, the general du jour, and the general of communication; the administrative staff includes the medical, intendant, artillery, engineers, pay, and auditing departments.

The incumbents of these positions were: Chief of staff, Lieutenant-General Sakharov; general of communication, Major-General Blagowieshtchonski; quartermaster-general, Major-General Kharkevich; general du jour, Major-General Sabjelin; medical department, Lieutenant-General Trepov; chief intendant, Major-General Huber; artillery inspector, Major-General Micheiev; engineer inspector, Lieutenant-General Alexandrov.

The chief of staff is the first assistant of the army commander and superintends the work of the field staff. Under him are the quartermaster-general, the general du jour, and the general of communications.

The quartermaster-general has charge of operations and reports, is the deputy of the chief of staff, and the superior of all general staff officers of the army. In his bureau there are four sections, the first dealing with operations, the second has the subject of reports, the journal of operations, and the personal records of staff officers, the third is the information division, and the fourth the topographical section.

The duties of the general du jour comprise returns and records, administration of troops, remounts, and control of the material in the hands of troops, and rewards and pensions.

Under him are, further, the army auditor, the chief chaplain, the printing office of the field staff, and the headquarters commandant. The latter was a colonel who commanded the headquarters guard, was responsible for the safety of headquarters, regulated the service, and had under him an officer commanding the train, the train company, tradesmen, orderlies, etc.

The general of communications performs the duties indicated by his title and his office was organized in the bureaus of administration of field étapes, Major-General Uxkull; administration of roads and rivers, Major-General de la Sorre; administration of posts and telegraphs, State Counsellor Andreiev; administration of army transports, Colonel Ukach Ogorovich.

The administration of the field étapes deals with the organization of the communications, organizes the administration of occupied districts, and is divided into four sections dealing with (1) chiefs of étape districts; (2) étape commands; (3) étape troops; (4) horse depot.

The administration of roads and rivers is charged with the construction, repair, and operation of land and river highways and railroads. The four sections of the office deal with (1) military railway direction; (2) chiefs of land and river highways; (3) railway battalion, detachments of workmen, of operative personnel, and of guards; (4) depots of necessary material.

The administration of posts and telegraphs is charged with the organization and operation of post and telegraph lines in the theater of operations not occupied by the troops. The three sections of the bureau are presided over by the field inspector of the postal service, of the telegraph service, and of the postal transportation service.

The administration of army transports regulates the service of the étape transport parks, establishes new parks where necessary, and deals with the train battalions.

THE ADMINISTRATION STAFF.

The medical service was under Lieutenant-General Trepov, who had under him (1) the field hospital administration; (2) the field medicine administration; (3) the field veterinary administration; (4) the representatives of the Red Cross.

The field hospital administration was under Major-General Jeserski, who was charged with the establishment and use of all sanitary establishments not under charge of the troops, and the supply of furniture, etc., to all medical establishments of the army.

The field medicine administration was under Prof. E. Botkin, who was chief surgeon of the army, had charge of the supply of medicines and dressings and the records of the medical personnel.

The field veterinary administration was under State Counsellor Nowikov, and the representative of the Red Cross was Mr. W. W. Alexandrovski.

The army intendant dealt with the subsistence, equipment, and clothing of the army.

The army artillery inspector was Major-General Micheiev, charged with the technical direction of the artillery service, supply of ammunition, and replacement of artillery material. Under him was the chief of the artillery parks, with three sections for army artillery parks, mobile artillery shops, and advance depots of artillery material.

The army engineer inspector was Lieutenant-General Alexandrov, charged with the technical direction of the engineer service, supply of tools to the army, plans of fortifications and sieges, construction of roads, etc.

The chief paymaster and controller's office require no explanation.

THE CORPS STAFF.

Like an army staff the corps staff consists of the corps staff proper and the administrative staff.

At the head of the corps staff is the chief of staff, who had the rights and prerogative of a division commander toward the personnel of the staff. This office is divided into three sections.

At the head of the first section is a field officer of the general staff with several assistants. He deals with strategical and tactical matters.

The second section is under charge of a field officer not necessarily of the general staff, who deals with returns of troops and records. Under him is the field officer, who is the headquarters commandant, and the headquarters guard of 1 officer, and 22 Cossacks.

The third section deals with matters concerning supplies, funds, etc.

To the administrative staff belongs the bureau of the chief of artillery, of the corps intendant, the corps surgeon, comptroller, and paymaster. These bureaus need no explanation, but attention is invited to the comptroller who, assisted by four officials, examines all money accounts in the field.

The division staff is similarly organized, but on a smaller scale. The division is the tactical administrative unit, and the division commander has great responsibilities and power. He grants permission to marry to general and field officers, grants leaves to generals and regimental commanders for two months, to company commanders and subalterns for four months. For dismissal of subalterns he applies direct to the chief of staff in St. Petersburg, in the case of higher officers he applies through his corps commander. His chief of staff is usually a colonel of the general staff.

RÉSUMÉ.

Among the chief causes that led to the defeat of the Russian army are lack of preparedness, lack of mobility, initiative and offensive spirit, the latter two the result of the low intellectual status of the Russian soldier.

The establishment maintained by Russia in the Far East in time of peace consisted of 6 Siberian rifle brigades of 8 battalions and of 3 Siberian reserve infantry brigades of 4 battalions each, a force altogether too small to cope with the Japanese army. The 3 Siberian reserve infantry divisions did not reach the seat of war until June. The 6 rifle brigades were expanded into as many divisions and three additional divisions were formed with the two European brigades sent east in 1903. Russia could indeed muster as many divisions as Japan, but her divisions were smaller than the Japanese divisions. Whereas the Japanese divisions may be put down as 14,000 infantry the 9 Russian East Siberian rifle divisions numbered but 9,600 rifles each and the other divisions 12,800 rifles each. There was nothing to balance the Japanese reserve brigades, and all further reenforcements for Kuropatkin had to come from Europe. In cavalry Russia was superior, but the ground was so unfavorable that the cavalry was handicapped everywhere and could do little more than mounted infantry.

In artillery Russia was very much inferior. She was engaged in transforming her field artillery armament; she had but half enough guns in the Far East to supply her tactical units, and even these with their ammunition, carriages, and parks had to be exchanged for the new type. The gun was new to the army. While the Japanese gun was inferior to the Russian the inequality was more than balanced by superior mobility, gunnery, and numbers.

The disadvantages arising from Russia's lack of preparation were further enhanced by lack of transportation facilities. The Russian reenforcements had to come over a long single track railroad with a light rail and earth or sand ballast, whereas the Japanese line was much shorter and employed the steamship. In consequence the Russian army was never able to accumulate troops fast enough to equal the Japanese, and had to fight against odds in every battle.

While the military resources of Russia were more than ample to overcome Japan, the means were lacking to get the resources where they were wanted, just as in 1894 China was unable to exert her full power against Japan. Had the Siberian railroad been a double track road with heavy rail, Russia would not be in the predicament in which she is now, for she could have accumulated such masses of troops as would have enabled her to make up by their quantity for what they lacked in quality.

The Russian army was heavy. The heaviness and slowness is due in part to the size of her units, the weight and bulk of the equipment and to the lack of intellectual power. We find equally large units in other armies, but there the intelligence of the masses and a highly trained corps of officers give the troops the mobility and elasticity that was lacking in the Russian army. The general and military education of the Russian officer leaves something to be desired. The officers are the nerves and brains of the army. The lower the intellectual averages of the men the greater must be the number of officers. On that account there were not enough officers in the Russian army from the beginning, and as the war carried them off—after the battle of Liaoyang the Ninth East Siberian rifle division had but 93 officers for duty instead of nearly 300—the efficiency of the army fell rapidly. Whatever the personal failings of the Russian officer may have been, he is generally a hard working man who has done the best he could with the material intrusted to him. He has failed, not so much from lack of effort on his part (he cheerfully shared the hardships and privations of his men and willingly laid down his life), but he was handicapped all the way through by the low intellectual standard of the men he commanded. The superior intelligence, discipline, mobility, and aggressive spirit of the Japanese army stand out so sharply that no one can overlook them who is in search of the qualities that help to win victories.

As regards infantry the war has shown that the days of the bayonet are not yet numbered. In view of the great range and rapidity of fire of the present infantry weapon it was thought at one time that hand to hand conflicts between dismounted men had become impracticable, and this opinion was strengthened by the killing power of shrapnel. The war in the Far East has shown that such hand to hand conflicts may often take place. In order to avoid undue losses in the advance to the point of attack both sides made frequent use of the cover of night and bayonet encounters were frequent in such operations. But they were by no means confined to the night; they were frequent in daytime also. The Russian had no high idea of the marksmanship of the Japanese infantry, and since my return I have learned that the Japanese entertain a similar opinion of the Russian marksmanship. The question now arises whether it was the mutual inefficiency in infantry fire that made bayonet attacks practicable in day time or whether a strong determination to do and die made them succeed in spite of the opponent's fire. When the details of this war are sufficiently known it will be probably discovered that boldness and resolution, coupled with some degree of skill, will in the future, as in the past, lead to hand to hand fighting and to victory. The power of the shrapnel has made the task of the infantry more difficult than ever. Not only must infantry keep out of sight as long as possible, but its formation when within range of the shrapnel must be so as to afford the smallest possible target—i. e., lines of small columns at the longer ranges, open order when close, and all must use all the cover the ground affords. I believe that our drill book supplemented by the field service regulations fully meets the requirements of infantry work in campaign, and it is especially fortunate that our officers have always exhibited such keen interest in the small details of the services of security and information and of the attack. It is the sum total of small individual successes that strips the veil from the enemy's position and lays it bare for attack; it is the success of small parties drawing after them the greater ones that enables the general to win his battle. As to the technique of the details of the infantry attack we have, I fully believe, nothing to learn from this war for our regular infantry. While our volunteer troops have generally been good fighters the question for us is whether in future we shall have time to impart to our volunteer forces that steadiness which the bewilderment of the modern battle demands.

We shall, of course, always have on our side the irrepressive American spirit of enterprise and a high average of intelligence. But in addition to that our infantry will need strict discipline and great physical endurance, and the units must have been welded together into homogeneous higher units. To impart all of these qualities requires time. The physical exertions and the mental strain of the ten days' battle are apt to break down the entire human system—even the stolid nature of the Russian officers and soldiers succumbed under the stress of battle and numbers of them became insane at Liaoyang—and neither patriotism nor enthusiasm will be able to hold up the men; it is discipline alone that will triumph over human nature.

Cavalry as a mounted arm still holds its place as the eye and ear of the army; before the battle it is in front, during the battle it is on the flanks. But even these strategical duties of cavalry are becoming more and more difficult, owing to the long range of firearms. There are few examples in this war for the employment of cavalry in battle. One side was very superior in that arm, the other was disproportionately weak; which may be one of the reasons why we find no cavalry battles in this war, aside from the question of the terrain, which in southern Manchuria is against cavalry, in the hills at all times, and in the plains while the crops are high and the ground is soaked.

The war has shown nothing new in the use of cavalry in dismounted action, and the achievements of our cavalry in the civil war still stand unsurpassed. Dismounted cavalry, however, can no longer hope to fight successfully superior numbers of infantry as it did in the civil war, because it has no longer the advantage in armament it then had. Even the artillery is so armed now that if it knows how to shoot it can keep cavalry away.

The arm that has gained most is the field artillery. The shrapnel is a most effective and deadly projectile and in combination with its long range compels all to hug cover. The side that stands on the defensive must have very substantial cover if it wishes to avoid murderous losses and at the longer ranges with the steeper angle of incidence of the shrapnel the reverse slopes of hills offer little protection. It is therefore necessary that not only the firing line on the front slopes but the reserves on the reverse slopes be protected by suitable cover. The high explosive shell destroys cover readily and the Russians were at a great disadvantage in possessing no such projectiles for their field artillery, and Japanese troops were comparatively safe from artillery fire once they got into a Chinese village.

The long range of the modern gun permits of a concentration of fire on any desired point without change of position, and the greater the extent of the front of the guns the more their fire will be converging and searching. The preparation of the last attack on the First Siberian Corps at Liaoyang on August 31, 1904, was up to that time probably the severest artillery fire encountered on any battlefield and will become an historic instance of the use of artillery. Without the protection of substantial trenches nothing on the ground covered could have lived under that fire. It showed the possibilities of concentrating the fire of the guns, and it showed the magnificent fire direction and control on the part of the Japanese artillery. I was greatly impressed with the possibilities of field artillery and with the necessity of having as much of it as is consistent with the mobility of an army, and of having it properly organized and trained. The increasing use of indirect fire as the war progressed is worthy of careful study; the advantages of its effective use are obvious. The careful selection of artillery positions has become more important than ever; next to their own effective fire a carefully selected position that deceives the enemy as to the exact location of the guns is their greatest protection.

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GENERAL STAFF.

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Stanford University
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1907

REPORTS
OF
MILITARY OBSERVERS
ATTACHED TO
THE ARMIES IN MANCHURIA
DURING THE
RUSSO-JAPANESE WAR.

(OCTOBER 1, 1906.)

PART II.

Reports of—
Colonel VALERY HAVARD, Assistant Surgeon-General.
Colonel JOHN VAN R. HOFF, Assistant Surgeon-General.

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NOTE.

It has not been practicable to publish the complete reports of Colonels Havard and Hoff on account of their length, and numerous omissions have been made in the text.

4

Report of Col. Valery Havard, Assistant Surgeon-General, U. S. A., Observer with the Russian Forces in Manchuria.

NOTE.—Colonel Havard sailed from New York for the seat of war on November 16 and arrived in St. Petersburg on December 7, 1904. Here he was delayed until December 27, waiting for the authority of General Kuropatkin to proceed to Manchuria. He left St. Petersburg on December 28, 1904, and arrived in Harbin on January 18, 1905. After visiting all the hospitals at the latter place he proceeded south on February 3 and reached Mukden on February 8.

On the occupation of Mukden by the Japanese, on March 10, 1905, Colonel Havard (with Captain Judson, Corps of Engineers, U. S. Army), was captured and sent to Japan, where he was released and allowed to return to the United States.

GENERAL CONSIDERATIONS.

The Russo-Japanese war presents prominent features, apparently the result of the normal evolution of modern warfare, which affect the medical department as well as all other branches of the service. These features may be enumerated as follows:

1. The enormous strength of the active armies in the field. Thus (counting both sides), 410,000 men at Liaoyang, 475,000 at the Sha River, 800,000 at Mukden. It shows the tendency of modern nations to rely not only on improved training and armament, but also, like Napoleon, on more and bigger battalions.

2. The great length and irregularity of the line of battle, extending over 10 miles at Liaoyang, 60 at the Sha River, and 80 at Mukden; therefore the more independent action

of corps and division commanders and the greater probability of the separation and isolation of medical units.

3. The impossibility for the general commanding an army corps, or larger force, to see more than a very limited part of the battlefield. Hence the necessity of an effective telephone service quickly organized in rear of the advancing columns and centering at his headquarters. He thus fights the battle without perhaps seeing a shot of it. Marshal Oyama and his chief of staff, Kodama, directed the movements around Mukden from their headquarters at Yentai, 28 miles south of that city.

4. The great difficulty or impossibility of successful frontal attacks on account of the number and strength of entrenchments; hence the necessity of flanking or turning movements by wide detours involving a more or less complete separation from bases, much forced marching, and many hardships.

5. The long period of time covered by the series of engagements which constitutes what is conventionally called a battle. Thus the fighting at Liaoyang lasted five days or more, on the Sha River eight days, and about Mukden twenty days. It is not meant that the whole line is engaged during that number of days, but that fighting is going on at several points, with a possibility of its extending at any time in any direction, or to the whole line, and that each individual soldier is subjected to greater fatigue and nervous strain, as well as exposed to greater danger.

6. The frequent night fighting, the action being continued after dark, renewed or begun during the night or before dawn. During such nocturnal engagements mêlées are inevitable and the bayonet plays an important part.

7. The almost complete disregard of weather and climatic conditions, the most rigorous winter not interfering with active operations. Thus the battle of Chentanpu was fought from January 20 to 30, the very coldest period of the winter, a northerly blizzard blowing during several days of it.

8. The increased importance of field artillery which plays a more decisive and preponderating part than ever before in the issue of a battle.

9. The continued demonstration of the benign or humane effect of the small caliber, hard-jacketed bullet

10. The enormous proportion of casualties occuring in regiments, brigades, or divisions bearing the brunt of the battle, sometimes almost amounting to annihilation, while the general ratio of killed and wounded to the whole strength of combatants is not very much greater than in former wars.

11. The full recognition by both belligerents of the rights and privileges of the wounded soldier, in accordance with the spirit of the Geneva convention.

12. The increasing importance of the part played by Red Cross societies, a part hardly secondary to that of the Medical Department, and therefore the desirability to promote their development and efficiency.

From these features of the Russo-Japanese war obvious conclusions suggest themselves, so far as the Medical Department is concerned.

In any war in which we may become engaged our skeleton army would have to be rapidly expanded to many times its present strength. Therefore a system must be devised whereby a sufficient number of qualified medical officers can be obtained. We must have a large reserve corps of able physicians and surgeons willing, when the emergency comes, to be mustered into service. It is specially necessary to secure the services of all our eminent surgeons for duty at base or general hospitals.

The wide extension of corps and divisions makes it more difficult for the chief surgeon to keep in touch with his several organizations and send assistance wherever necessary. In fact, this becomes impossible without the help of the electric wire. Therefore the telephone system must include the field hospitals within the zone of its operation. But telephonic communications can not always be relied on, and consequently it is more desirable than ever that divisional organizations be fully manned and equipped, so as to be capable of independent action in case of separation and isolation. The importance of having one or more bearer companies and field hospitals in reserve in each corps, so that assistance may be sent wherever needed without depleting any organization already in line, is also strongly accentuated.

The extended formation of an army in the field, with seldom more than a brigade of 3,000 to 4,000 men to the mile, has a most important bearing on the hygiene of camps;

it precludes large agglomerations, prevents the rapid spread of contagious diseases, and accounts to a large extent for the absence of epidemics in either the Russian or Japanese army.

The center of an army being its strongest point, the safest place for the first line of hospitals and supply depots will be in its rear; in that situation they will also probably have the advantage of better railway connections. The flanks are less securely held, more liable to severe attack, and more likely to shift; therefore field hospitals attached to the wings of an army, if not behind a naturally strong position, should be farther to the rear.

The continuance of a battle for several days renders the task of surgeons and hospital corps more arduous than ever, the more so that night does not necessarily bring a temporary cessation of fighting. The wounded accumulate in greater number and are less likely to receive prompt attention. The service of evacuation is taxed to the utmost and, unless very well organized, is in danger of breaking down.

The great and rapid accumulation of wounded men at certain points makes the task of the surgeons an impossible one unless ably assisted by a well-instructed personnel. Hospital Corps noncommissioned officers and, if needful, privates, first class, must be thoroughly qualified to apply the first-aid dressing. The importance of a well trained and instructed hospital corps on the battlefield can not be overestimated.

The effects of night fighting, from the surgeon's point of view, are simply horrible, not only because of the larger proportion of bayonet and sword wounds, always very grave, but on account of the impossibility of searching the field and bringing in the wounded, who are thus likely enough to remain one, two, or more days without medical assistance.

Very important in modern warfare are abundant means of evacuation, especially steamers and trains, so that patients may be safely but speedily conveyed beyond the zone of conflict or of probable conflict. Thus Russia had its base hospitals scattered at all convenient points from Manchuria to Irkutsk, west of Lake Baikal, a distance of nearly 2,000 miles. Field hospitals should always get rid of their inmates as quickly as possible, so that they may be able to follow their respective divisions; but prompt evacuation is much more imperative when a battle is likely to last several days.

Since neither excess of heat (as at Santiago de Cuba) nor of cold (as in Manchuria) necessarily interferes with military operations, great care must be exercised in providing clothing well adapted to the climate, making suitability the first and chief requirement of the uniform. Whenever troops operate in very cold or very hot weather an added responsibility rests upon the medical corps to watch with greater solicitude over the hygienic surroundings of the men and their diet.

One of the consoling features of the Russo-Japanese war is the fullness and sincerity with which the spirit of the articles of the Geneva convention has been carried out. As a very general rule each belligerent has, whenever practicable, removed the wounded of the enemy from the field and taken care of them. There was hardly any hospital, Russian or Japanese, where wounded of both nations were not found lying side by side in the same wards and receiving the same care. The humanity of the enemy relieves the surgeon from great anxiety and should influence his line of conduct in a certain class of cases; I mean very serious to desperate cases. Such patients on the defeated side if picked up hurriedly and carried several miles on rough conveyances are almost necessarily doomed to death. It would seem decidedly to their interest to be left at the dressing stations to be taken care of by the victors.

After carefully observing the working of the Russian Red Cross Society, and, to a lesser extent, that of the Japanese, I have come to the conclusion that the aid of such societies in modern wars is invaluable and indispensable provided they are efficiently organized and thoroughly subordinated to the medical department. Whatever may be the strength and excellence of the medical department, there are always times and places in a campaign when it is unequal to the demands made upon it and when, unless outside help is obtained, the sick and wounded are exposed to severe and prolonged suffering from inevitable delays in attending them.

A Red Cross society to be available in time of war must be organized and trained in time of peace—in other words, it must be a permanent society, as in Russia and Japan, always ready to assist the victims of accidents, catastrophes, tornadoes, famine, etc., and with well-matured plans of mobilization in case of war. Such society offers to all citizens not actually mustered in the service an opportunity to furnish whatever help they can to the Government in its hour of danger. It should take particular pains to get on its rolls the names of all the eminent surgeons in the land unwilling to be mustered into the volunteer service.

CLIMATE.

Manchuria is free from endemic or prevalent disease of any kind and may be considered one of the healthiest countries in the world. Its climate, like that of our middle Northern States and other continental countries, is characterized by extremes of heat and cold, with sudden transition from winter to summer, and moderate rainfall. Freezing weather begins in November. The coldest months are December, January, and February, the lowest minimum ranging from —25° to —30° F. at Harbin (latter half of January), from —15° to —20° at Mukden, and —5° to —10° at Port Arthur. June, July, and August are the hottest months. At Harbin the maximum temperature ranges from 90° to 95° F., at Mukden and Port Arthur from 95° to 100°. Thawing takes place in April, often producing deep mud. Then there is an interval of dry weather until the beginning of the heavy rains in June.

The increase of temperature from Harbin to Port Arthur is uniformly regular, being somewhat less south than north of Mukden. Thus the mean annual temperature for Harbin (computed from the observations of five years) is 38° F., that of Mukden (from the observations of seven years) 46°, and that of Port Arthur (from the observations of two years) 50.5°, from which it appears that the increase of temperature is 1.78° for each degree of latitude from Harbin to Mukden, and only 1.28° from Mukden to Port Arthur. The greater mean of Port Arthur is due chiefly to the milder winter weather; thus while the mean temperature for January is —1.66° at Harbin and 20.12° at Port Arthur, a difference of nearly 22°, the difference for July between the same two places is less than 4°.

If we compare the climate of Manchuria with that of our interior States within the same latitudes, we find that it is much colder. Thus Harbin, although on the latitude of Montreal, Duluth, and Bismarck, has the mean annual temperature of Quebec, northern Ontario, and of the northern boundary line of Minnesota and North Dakota. Mukden, although on the latitude of Providence, Cleveland, and Omaha, has the mean annual temperature of Portland, Me., Kingston, and St. Paul. Port Arthur, although on the parallel of Richmond, Louisville, and St. Louis, has the mean annual temperature of Boston, Hartford, and Cleveland. In round numbers it may be stated that the isothermal of any parallel in middle and southern Manchuria would run at least 3° of latitude farther north in our Atlantic and Middle States and 6° or more in our Pacific States. I shall not attempt to explain this difference.

It should be mentioned that last winter (1904–5), in Manchuria, was less severe than the average, the lowest temperature at Mukden, in January, not falling below 10° F. and in February not below 6°.

The average precipitation (rain and snow) at Mukden is 33 inches (mean of seven years), somewhat more than at Harbin and more than twice as much as at Port Arthur. The southern end of the peninsula is therefore very dry and barren. This precipitation occurs mostly from May to October (27.43 inches), the period from November to April being practically rainless and almost snowless.

The winter, then, can be characterized as being very cold and very dry; a persistent, renlentless cold, with a brightness of atmosphere which, on calm days, makes perfect winter weather. Rivers are frozen solid until April; and as there is seldom any snow upon the ground, travel and transportation in wheeled vehicles are easy on roads, and possible in any direction on horseback. Unfortunately, strong winds are common, raising thick clouds of dust along the roads and in the vicinity of towns. Soldiers operating in Manchuria and other parts of China in winter do not need snow glasses, but (like the Japanese soldiers) should be provided with dust glasses and a piece of gauze to protect nose and mouth. After the heavy rains set in the rich loam, of which the fertile soil of Manchuria mostly consists, becomes thoroughly soaked to a great depth; then the use of wheeled vehicles is almost impossible and horseback riding difficult.

WINTER QUARTERS.

Russians seem to require a higher degree of heat than most other people. Summer and winter they wear more clothes than people of other countries with about the same climatic conditions. Cold, in their judgment, is the greatest of physical evils. To keep warm in winter is the first preoccupation. To do this without too great an expenditure of fuel is the problem which they have successfully solved. The Russian stove is essentially a very large brick stove, cemented or stuccoed or often covered with decorative earthenware. From the fire box the flue describes a series of curves within extending the whole length of the stove, never less than three, causing the heat to come in contact with a large extent of the brickwork and propagate itself to the whole structure, enough becoming stored to last several hours after the fire goes out. Such stove, fired once in the morning and evening, gives off sufficient heat for ordinary purposes; but if fuel is available, the fire is not allowed to go out. The advantages of this system deserve attention. There is a great saving of fuel; the heat being constant, never excessive, there is no danger of accidental burning and no parching of the air such as renders the atmosphere of a room heated by an ordinary stove or hot-air furnace so very unpleasant to breathe; finally, as the draft of the fire box is rather slow, ventilation is obtained without objectionable currents. This stove is found in all Russian houses, as well as in hospitals and other public institutions in which the more modern systems of water and steam heating have not yet been introduced. In Manchuria it forms part of all new buildings. In Chinese houses, occupied by Russians, it takes the place of the khan.

Ordinary sheet-iron stoves are also frequently used on account of their convenience and cheapness, but the Russian always strives to increase the heat-absorbing capacity by adding a layer of brick, refractory brick if obtainable, inside or outside. A special kind of iron stove was sometimes seen, of corrugated iron lined with brick, and with pipe describing a downward loop, the apex resting on the ground, before ascending to the flue.

In Manchuria the use of tents in winter, even were it possible to provide enough of them, would be impossible to the Russian soldier who could not keep warm in them. Log huts would require too much timber and labor. Therefore he burrows into the ground and constructs dugouts. The Russian dugout, or zemlank, is of variable size, according to the number of its inmates, sometimes large enough to accommodate a whole company. It consists of an excavation 3 to 4 feet deep, covered with gable roof, front and rear carefully closed in. In the ordinary small dugout the door is the only opening; if a pane of glass or transparent Chinese paper be available it is set in the roof, but oftener no provision is made for light. The framework is made entirely of poles, consisting of uprights supporting a ridge upon which rest the rafters. Over these are spread the stout stalks of kaoliang (species of sorghum, the most abundant agricultural staple of Manchuria) and a thick layer of earth. On each side of the central excavation, which is used as a passageway, is an earth platform 1 or 2 feet high and some 8 feet wide, where are the cots, matting, or straw upon which rest and sleep the occupants. In a small dugout only intended for a few people the platform may be of any size and in any convenient position, but most zemlanki occupied by troops are as above described, and therefore seldom less than 18 feet wide, namely, the width of both platforms and passageway separating them. The stoves, of brick or earth, are placed at regular intervals along the middle line, or better, along the edge of one of the platforms so as not to be in the way. The chimney passes right up through the roof, or, probably oftener, is built just beyond the edge of the roof, being connected with the stove by an underground flue dug through the platform. The zemlanki are often substantially built; occasionally they are well lighted, with regular sashes set in the roof, and even have ventilators in the shape of air boxes through the roof. As a rule they are always comfortably warm, and this sums up all their hygienic advantages. The men sleep side by side on the platforms upon straw ticks or, when straw fails, upon or in their overcoats. Hardly ever is a blanket seen. The question of air space is not considered. The zemlank being at once squad room, dormitory, and messroom, one can easily realize the difficulty of keeping it clean and tidy, and the foul condition of the air. Yet it is a notorious fact that during the winter the men remained in very good health and were remarkably free from the usual camp diseases.

Instead of one platform on each side of the more deeply excavated passageway the zemlank may be wide enough, as when constructed for a whole company, to have two passageways and four platforms. At Mukden were two large comfortable hospitals in zemlanki having four passageways and eight platforms, and capable of accommodating hundreds of patients. In these hospitals the outside platform—that is, the one nearest to the roof on each side—was used only for supplies, clothing, and linen. The heating was effected by two rows of brick stoves placed on the platforms.

In Manchuria zemlanki become uninhabitable in spring (April) as soon as snow and earth begin to thaw. Therefore the Russians made extensive preparations about Mukden to replace them by light improvised barracks without any excavation. Quite a number of these had already been built at the time of the battle of Mukden, and the enormous accumulation of material showed an intention of constructing them on a very large scale. They consisted of a simple framework of poles, covered with kaoliang and earth, the mud walls being about 3 feet high and the sleeping platforms of earth or wood raised 1 or 2 feet above the soil.

Canvas was seldom seen in camps or hospitals. As one looked from a height upon the line of Russian positions along the Sha River no "tented field" was visible, only patches of minute earth mounds on the plain under the crest of ridges or on the slopes of hills. Such camps had the great merit of inconspicuousness; in the plain they were not very different from Chinese villages.

Also frequently used as winter quarters, especially in the vicinity of towns, was the yurtz of the nomadic tribes of Siberia and Mongolia. It is a circular, low-domed tent of thick, coarse felt, about 15 feet in diameter and 10 feet high in center. The walls consist of pieces of trellis work, with jointed meshes, permitting partial closing (for packing) and expanding (for setting up), covered with felt on both sides. The roof is supported on rods converging from the walls to a hoop forming the summit. Inside the hoop passes the stovepipe.

The fuel used to heat the Russian army in winter quarters was almost exclusively wood. Much of it was brought from Siberia, and a large proportion was also obtained in situ, with the result that nearly all trees were cut down and most of the uninhabited Chinese houses demolished.

The usual Chinese method of heating is as follows: In each room are two lateral platforms about 2 feet high running the whole length of the room; these are the khans; upon them are the mats or bedding, upon which sleep the inmates. Each khan is heated by two flues passing under it and into the chimney outside. The fire pit is in the hall; four fires are often seen in the central hall, two on each side, or a fire for each khan. Over the fires, or some of them, are commonly large basins, so that hot water is always at hand. As the draft is often insufficient and irregular, the heating of the khans is quite variable and smoking frequent.

EFFECT OF COLD ON SOLDIERS.

Experience in different lands and at different times has demonstrated that active warfare can be successfully conducted in the coldest winter weather. Winter has advantages for the movement of an army, especially if snow is scant or entirely absent, as in Manchuria. All streams and marshes being frozen solid, troops can proceed, with cannon and vehicles, in any direction without serious topographical obstacles.

During the present Russo-Japanese war the belligerent lines, after the battle of the Sha River, settled themselves into winter quarters on each side of that historic stream. For three months they remained comparatively inactive, but probably not so much on account of the cold as because of the need of recuperation and reenforcements. On about January 20th the Russians began their movement on the right, which culminated in the battle of Chentanpu. The Russians doubtless entertained the belief, frequently echoed in their newspapers, that the Japanese were severely suffering from the rigorous winter weather; that they were badly clothed and insufficiently protected; that, anyway, coming from a mild climate, they had but feeble powers of resistance to the cold, and if obliged to come out of their sheds and face the prevalent northerly wind would be badly handicapped and unable to put up a stout defense. The Russians accordingly crossed the Hun and were at first partly successful, but were afterwards driven back, recrossing the river on the 29th and reoccupying most of their old positions on the 30th. The result was a decided advantage for the Japanese, whose losses were much less than those of the Russians. During this period of about ten days the weather was unusually cold, ranging from 5° to 10° F. below zero, the icy northerly wind blowing into a gale from the 24th to the 28th and driving the thin dry snow that fell at intervals, so that much of the fighting took place in a blizzard. The Russians had wind and snow in rear in advancing, but in the face on retreating. The Japanese had to face the storm most of the time, but when on the defensive, during the first days, had the advantage of being more or less sheltered behind their works. Therefore the exposure was about the same on both sides.

Which side suffered most from frostbites would be hard to determine, each claiming to have suffered much less than the other. The Japanese reported that the number of men who had to leave the field on account of frostbites was only 505—300 in one division and 205 in another—while nearly one-half of the wounded were more or less affected, but not many seriously. In rare cases was the amputation of a toe or finger necessary. Very few of the men had more than one pair of gloves (cloth), but their hands were comparatively little affected. I have not seen any account of the number of frostbites on the Russian side, but it probably was not much smaller. I saw but few cases of frostbites in the

Mukden hospitals requiring amputation, but it is impossible to say how many may have been sent direct to hospitals farther north.

The fate of the wounded in freezing weather is doubly terrible. There is no doubt that hundreds of them must have perished from congelation, the more so that the task of the litter bearers is rendered much more arduous. The tearing or cutting of part of the clothing to apply a dressing is often a cause of dangerous exposure, and the choice of evils must be considered. It was also noticed that many frostbites resulted from the freezing of blood on the skin.

The Japanese noticed that those among them who wore two or three pairs of socks fared badly unless their shoes were unusually large. This is attributed to the resulting tightness impeding circulation. They appear to have an antifrostbite plaster (tosho-ko) from which they claim excellent results.

The remarkable power of resistence to cold displayed by the Japanese has caused general surprise, but it can doubtless be readily explained by their general vigorous constitution, their home habits of wearing scant clothing in all seasons, and going barefooted even in winter, of living in thin-walled houses heated, if at all, only by braziers. The Japanese soldier did also seek shelter in dugouts, but not to the same extent as the Russians, being more easily satisfied with tents, sheds, and Chinese houses, and less opposed to ventilation. It should be borne in mind that he is provided with blankets and a pocket stove.

As an instance of Japanese endurance to cold and fatigue may be noted the famous march of General Kawamura, who landed with his army at the mouth of the Yalu at the close of January and before the end of February was in position to take an important part in the battle of Mukden, having marched at least 200 miles over a roadless country in the depth of winter.

CLOTHING, UNIFORM, AND EQUIPMENT.

Russians, as a rule, wear about the same kind of underclothing throughout the year. The changes rendered necessary by difference of temperature are made in the outer garments. Furs are held to be absolutely necessary in winter in St. Petersburg, although not usually worn in towns of about the same latitude in Sweden and Norway. If this be not a matter of habit, it should be attributed to the penetrating quality of the damp cold of the Russian capital, a cold against which only fur can protect.

The uniform of the Russian infantry soldier on active service consists of a dark-green double-breasted blouse, not cut to fit except in the guards, and fastening with hooks and eyes, with stand-up collar and cloth shoulder pieces, dark-green knickerbockers with piping only in the guards, a dark-green flat cloth cap, circular at top, with colored band and no peak, and long boots reaching to the knee. The great coat is of heavy grayish-brown cloth (friezelike), reaching to halfway between knee and ankle, and a sheepskin coat reaching to the knees is worn under it in winter.

The cavalry soldier also wears the dark-green uniform, but with two rows of buttons on coat. Except in very cold weather the sheepskin coat and overcoat are seldom worn together. In summer, blouse, trousers, and cap of white linen are worn; but being very conspicuous, they were partly replaced by articles of brown material. The dark-green trousers are also often worn with the blouse and cap. The footgear consists of cloths, used instead of socks, and boots. In winter the boots are of thick felt, sometimes large enough to go over an inner pair of leather boots. To protect the hands, brown cloth mitts are worn, with thumb and two fingers, one for the index and the other for the remaining three fingers.

With the overcoat is issued a hood of brown camel's-hair cloth, called bashlick, but they can be worn independently, not being fastened to each other. This hood has two long tails, which can be passed under the shoulder pieces and secured under the belt. These tails permit the hood to be used for other purposes—for instance, as a muffler to protect head and face. It is highly appreciated by officers and men. The fur hat, or papahah, the winter headgear of the Russian soldier in Siberia and Manchuria, is of sheepskin, the wool outside and dyed black. It is unmilitary, looking like an unkempt, disheveled head of hair, and unsuitable, as it can not be pulled over the ears without also covering the eyes.

Its color makes it very conspicuous in the field. On that account it was covered with a grayish cloth in some regiments. The better fur bonnet of the officers is open to the same objection—that it does not protect the ears. The Nansen cap, with earlaps, is undoubtedly the best form of headgear for winter service in cold climates. The Japanese soldier transforms his ordinary cap into a winter cap simply by the addition of fur earlaps. It may also be noticed that the Chinese wear their winter hat with fur inside, cut low on the side to cover the ear, or else an ordinary hat with independent, detachable ear pads.

The fur cap and gloves issued to American soldiers for winter service in northern latitudes are far better than any similar articles used by Russian or Japanese soldiers.

In each division the four regiments are distinguished by the color of the cap band and the coat collar, the number of the regiment being shown on the cap band and that of the division on the shoulder piece. In winter nothing but the shoulder piece of the overcoat can convey information of the soldier's status.

The winter clothing of the Japanese soldier differs in many ways from that of the Russian. In the first place his underwear is of thick, ribbed flannel, with long abdominal band wrapped around. On his feet and legs he wears one or two pairs of ribbed, woolen socks or stockings, shoes, and a canvas bandage wound round, over his trousers, to the knee. Sometimes woolen toe caps are also issued to wear over the stockings. This footgear is not sufficient; he should wear something warmer and softer in winter. His feet, unused to restraint, or stiff covering of any sort, are easily chafed and excoriated by the army shoe and many men are disabled from that cause. On his hands he wears dark, thick cloth gloves or mitts. Neither Russian nor Japanese soldier has his hands properly protected in cold weather. The Japanese ordinary black overcoat of home service is replaced, for winter field service, by a long sheepskin vest, buttoning on the side, and an ample overcoat of drab, thick and soft wool, with fur collar. This vest seems preferable to the Russian sheepskin coat, being more easily put on or taken off, and not interfering with the free use of the arms.

Blankets do not form part of the Russian equipment. The Japanese soldier, on the contrary, is provided with two of them, and this partly explains his ability to stand successfully the Manchurian winter. Other interesting parts of the Japanese equipment are a pocket stove, semicylindrical in shape, 1 foot long and 4 inches in diameter, dust glasses, and a band of gauze to protect nose and mouth in dust storms.

MEDICAL VEHICLES AND TENTS.

STRETCHER.

The Russian stretcher consists of two poles 9 feet long, passed through a bottomless canvas bag 6 feet long and 28 inches wide, and kept apart by two unjointed traverses. The canvas is tightened at each end by two tapes tied around the traverses. The traverse is a solid piece of wood with ring at each end to slip over the corresponding pole, and bearing two plain iron legs 8 inches long, each strengthened by a small brace. No head rest is provided. The stretcher is taken apart by untying the tapes of the canvas bed and slipping off the traverses; one man carries the poles with canvas rolled around them, another the two traverses. Slings were not provided but were sometimes improvised. The canvas was of poor quality, easily yielding and sagging. There is not a single feature in this stretcher which I can point out for our imitation.

The Japanese stretcher is light, but otherwise very defective. Each traverse consists of two iron pieces, one screwing into the other so as to vary the tension of the canvas, but the device seldom works well; much time is spent in folding and opening the litter. The feet are light iron stirrups about 6 inches long, which fold under the poles when the stretcher is closed and fall down perpendicularly when it is opened, being locked in position by a metal ring.

AMBULANCE WAGON.

The Russian regulation ambulance, as I saw it in Manchuria, is a large, heavy, canvas-covered vehicle, intended for four recumbent or nine seated patients. It is well suspended on easy springs, but much too high for stability, the floor being 4 feet or more above ground. It weighs 2,088 pounds and can carry a load of 1,656 pounds. It requires special stretchers—the two lower rest upon the floor, upon which they slide by means of rounded blocks 2 inches high, which take the place of legs; the two upper are supported in leather loops, except the inner front handles, which rest on a forked prop. When not in use, the lower stretchers are carried under the floor of the ambulance and the upper over transverse rods in the dome. The benches for seating patients are carried outside the bows and held by the canvas cover; when needed they are slid out and hooked to the sides, resting on iron legs.

As elsewhere stated, the few regulation ambulances brought to Manchuria were hardly ever used.

DVUKOLK.

In the absence of ambulances, the usual, and one might say official, wheeled vehicle for the transportation of the wounded was the dvukolk—that is to say, a light, but strong, two-wheeled, springless cart, with shafts for one horse, but often with an additional horse hitched to an improvised swingletree. The body is 5 feet long, with sides and tail gate 2 feet high, the floor about 28 inches wide, and the distance between the slanting sides above 36 inches. The dvukolk is a convenient vehicle for baggage or supplies in rear of marching troops, being able to go wherever wheels can go, but, to me, it has been a cause of amazement that such a conveyance should be adopted as the ordinary means of transport for the sick and wounded. Probably the explanation is that it was on hand and nothing better available. It was used in various ways; three or four slightly wounded men could be accommodated on the floor upon straw or improvised seats, or two lying recumbent provided they were placed on their side, with legs flexed, since the floor is not wide enough for two men lying on their backs nor as long as the average length of a man. A better way, and one frequently used, is to open the tail gate about a foot (turning it on its hinges to an angle of about 45°), thus increasing the length of the vehicle above to about 6 feet. Then a piece of canvas is stretched between the sides and tail gate, secured to them by strong hooks slipped over their edges and supported along the median line by a horizontal pole. One patient is laid on each side of the pole, a very narrow and cramped bed for him. The patients were covered and protected from the cold in various ways, mostly by overcoats, blankets being seldom seen. Occasionally the vehicle had a canvas top, on bows, lined or not with felt. At Huanshan (headquarters First Army) I saw, as part of the material of a transport column, 100 dvukolk thus covered, the canvas dome lined with felt, with two straw ticks and blankets laid on the suspended canvas bed, and an interesting feature is a small stove underneath, consisting of a flat iron box placed inside a larger box, the smoke pipe passing out and standing up by the side of the cart, an opening in the tail gate permitting ready access to it. In whichever way the dvukolk is used there is no room for the driver, who walks by the side of the horse.

The Chinese cart or aba was frequently requisitioned and used on a large scale to carry the wounded. It is a heavy, clumsy vehicle, the axle and wheels revolving together, but preferable to the dvukolk, having a larger area and, with plenty of straw, permitting a man to lie down comfortably.

THE TWO-HORSE LITTER.

This is an excellent, safe, and comfortable means of transport used for the gravely wounded. It was seldom seen in the beginning of the war, but as its advantages became recognized, more were constructed and a certain number accompanied all transport columns. Yet, upon the whole, they played but an unimportant part in the system of transportation of the wounded, and can never be more than a useful adjunct to such system. The Russian two-horse litter consists of two bamboo poles fastened to light packing saddles, worn by the front and rear horses, and a canvas bed with straw tick and blankets. In cold weather the patient is completely covered with a hood of canvas lined with felt, opening upon hinges.

TENTS.

For hospital purposes, whenever tents are used at all, the official type in common use is 30 feet long, 24 wide, and about 14 high to the ridge, with walls 4 feet high. It is supported on four uprights, the ridgepole consisting of three jointed pieces. The fly rests directly upon the ridgepole by means of strong webbing loops. In pitching the tent the ridgepole must therefore be slipped through the loops before the tent is raised. The interval between fly and tent is from 6 to 10 inches. Four openings in the ridge of the tent, guarded below by a piece of canvas stretching across, serve as ventilators. Each corner of the tent is held up by a small pole. The canvas is of hemp linen, of various degrees of strength. This tent and all other military tents have green borders. For winter use it is made with double front and rear and double walls; the walls may also be lined with felt or blanketing. Two stoves are necessary to heat it in very cold weather. It is intended for twenty patients. Four are issued to the ambulance hospital, three to the field hospital, and one to the transport column.

The insuperable objection to such a tent is its weight (1,404 pounds) and bulk, therefore the great difficulty of pitching, striking, packing, and transporting it. In my opinion it is totally unsuitable for military purposes; even if deemed practicable for stationary hospitals, certainly it is not admissible for field and ambulance hospitals. Another objection is the manner of suspension of the tent from the ridgepole, instead of being borne upon it, as in our tents; it causes necessarily a great strain on the canvas where the loops are attached and frequent tears of the ridge.

There are two smaller types of hospital tents, obtained by reducing the length of the above tent without altering the width—one 18 feet long, the other 12 feet long, both held up by two uprights. What the advantages of such curtailed tents may be, so much wider than long, is not apparent.

FOOD AND RATION.

The ration of the Russian soldier is not so ample nor so elastic as that of the American soldier, but, judging from his excellent physical condition, it seems to be sufficient and satisfactory.

In the field, Russian officers, in addition to their pay, receive a food allowance of $2 per day for colonel, $1 for lieutenant-colonel or major, $0.50 for captain, and $0.30 for lieutenant. On their way to and from the field this allowance is reduced to one-half. If unable to provide their own food, they are entitled to gratuitous rations in kind, each officer receiving the same ration as the private soldier, with the addition of 1 pound of meat and about one-half pint of vodka.

The ration of the soldier in the field consists of: Black bread, 2¼ pounds, or hard bread (sukhari), 1 pound 9 ounces; fresh meat, 14⅖ ounces, or preserved or salt meat, 10⅘ ounces; grits or cereals, 3⅗ ounces; vegetables, 9 ounces fresh, or the equivalent of the compressed or dried article; tea, sugar, salt, butter or fat (for cooking), and pepper. Vinegar, as well as vodka, may be issued when ordered by the corps commander.

The bread is a coarse, black bread made from unbolted rye flour. It contains more fat and more mineral salts than white wheat bread, and is said by those using it to be more tasteful and satisfying—that is to say, one can more easily dispense with the usual accompaniment of butter, gravy, or jam. It dries rather quickly, crumbling readily under pressure of the fingers. I noticed that several of the foreign attachés and Russian officers with whom I was associated ate more or less of it, but never to the exclusion of white bread. The Russian soldier is said to prefer it, but with him it is a taste developed from habit, having seldom known any other. To the average American palate it is hard, dry, and unpalatable, and whatever slight superiority it may have in nutritive properties is, I believe, more than offset by inferior digestibility. Black bread has a well-marked property, due to its bran constituent; it acts as a gentle but reliable laxative, and as such is often of much value in the field. In garrison, whatever is not consumed is made into kvass, a wholesome beverage very popular in Russia.

Each division in the field has its bakery, consisting of several ovens partly sunk into the ground, and of a certain number of special tents, each solidly supported upon three A frames. As it never rains, and very seldom snows during the winter in Manchuria, the ovens were left unprotected.

The hard bread, or sukhari, is simply black bread dried in an oven, and has nothing to recommend it.

Each infantry man carries in his knapsack as a reserve 2½ rations of hard bread (about 4 pounds), and 1½ rations more of it are carried for him in the regimental baggage train, besides 3 rations of cereals or grits, 6 of salt, 4 of tea and sugar. This constitutes, as it were, the first line of food supply.

The meat was generally good, most of it being obtained from Siberia and Mongolia. During the winter there was no difficulty in its preservation and transportation, it remaining hard frozen from November to April. In summer live cattle are issued.

The emergency ration of the Russian soldier consists of the hard bread described above and a can of either roast or stewed beef, 10 ounces or less.

The cereals or grits issued to troops in Manchuria consisted of rice and also largely of the local Chinese staples, namely, kaoliang, a species of sorghum, the principal crop of the country, and shamisa, or millet.

The vegetables consisted chiefly of cabbage, peas, beans, potatoes, beets, and carrots, and were mostly obtained from Manchuria and neighboring country. Compressed vegetables were rarely seen.

Probably the most popular national dish in Russia and Siberia is tschi, an excellent and very palatable soup, of which the principal ingredients are beef, sauerkraut, and beets. Most foreigners soon learn to like it.

Tea is the national nonalcoholic beverage of Russia. It is generally made very light, from blackish, well-flavored Chinese leaves containing but little tannin, and one may drink many cups or glasses of it without any unpleasant after effect. Few Russians venture far from home without tea and teapot. Boiling water is found at all stations along railways, so that at any time of day soldiers and passengers may always have a cup of hot tea.

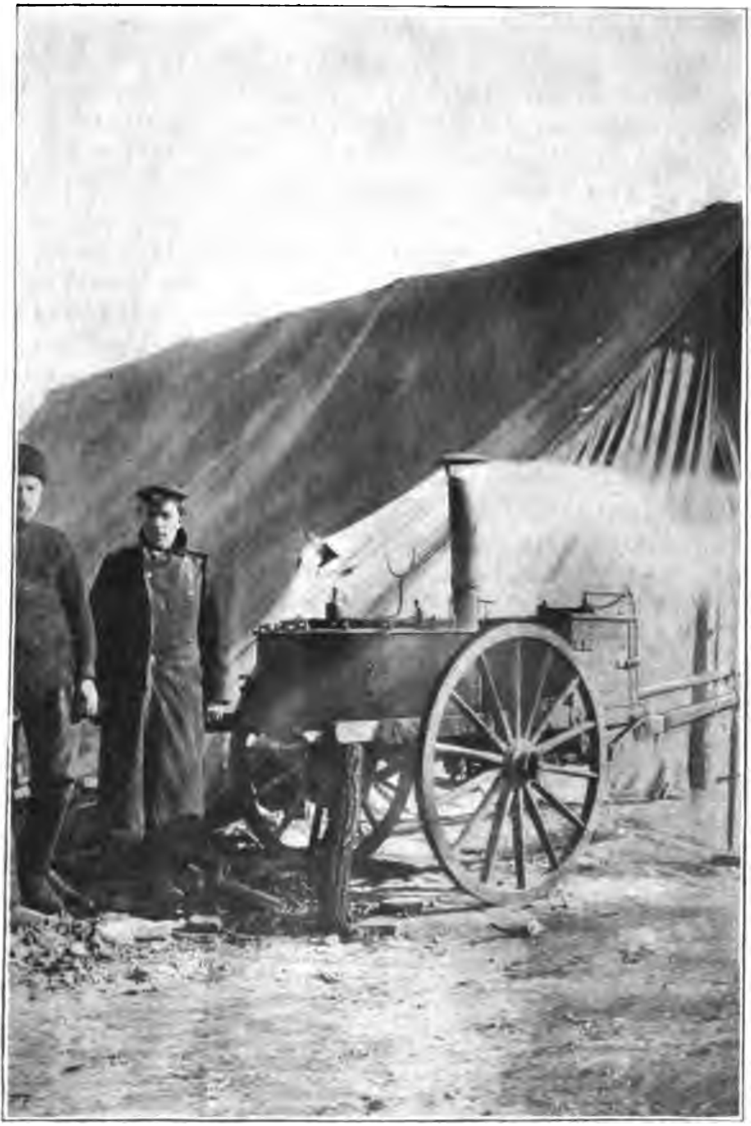
Tea, in my opinion, is the ideal drink for the soldier in the field. We should, in our service, substitute it for coffee, imitating, in that respect, the English, Russians, and Japanese. It is much easier to transport, preserve, and prepare, and if the infusion be made very light, can be drunk almost ad libitum without injurious effects, thus easily taking the place of water wherever water is suspected of contamination.

THE AMBULANT COMPANY KITCHEN.

One admirable feature of the Russian service in the field is the ambulant or traveling company kitchen. The kitchen for infantry or artillery, intended for 200 to 240 men, is a four-wheeled vehicle drawn by two horses, consisting essentially of a large boiler, with fire box and chimney, mounted upon a two-wheeled frame, and of two boxes mounted upon another two-wheeled frame, the two frames separable and connected in the manner of limber and gun. The boiler, of a capacity of 82 gallons, is double, the inner wall of copper, tinned inside, the outer of iron, lined with asbestos. The iron lid consists of two halves separately hinged to a diametral band and opening independently; it can be screwed down air-tight so that the contents can be cooked under considerable pressure, the danger of explosion being prevented by a safety valve. A removable, folding, perforated aluminum bottom, for cooking grits or cereals by steaming, can be placed in the boiler. The fuel is mostly wood: the products of combustion pass under and around the boiler and escape up the jointed chimney. When not in use the chimney is bent down upon a rest.

The boxes upon the limber contain oats and hay for a pair of horses for two days, various kitchen utensils, and food for the company for a whole day. The covers of these boxes, when opened, serve as tables for the cooks to cut the meat on, to chop up or clean vegetables, etc. Upon the front box sits the driver; in the rear is an iron cage to hold the wood. With a consumption of about 50 pounds of wood the food is cooked, whether in camp or on the march, in about two and one-half hours.

The cavalry kitchen is a two-wheeled vehicle drawn by one horse, with boiler and box upon the same frame. It is intended for 120 to 140 men, the boiler having a capacity of 51 gallons.



TYPE OF RUSSIAN AMBULANT FIELD KITCHEN.

Whether designed for infantry, cavalry, or artillery the ambulant kitchen is strong, light, well balanced, cooks quickly with comparatively little fuel, burning either coal, wood, straw, or turf, and its construction is so simple that any soldier can manage it. It is low enough to permit the cook to inspect the food even without stopping, if on the march, and is easily cleaned.

Into the boiler are put the meat, grits, vegetables, fat, salt, and pepper of the soldiers' ration. The result is an excellent soup containing a large proportion of nutritious and savory principles. In the hot, fragrant broth the men soak their hard, black bread. The meat is forked out, carved into equal pieces (by careful weighing), and eaten as a second course; it has the quality of being always thoroughly cooked and in a very digestible form. The grits may be cooked separately on the perforated bottom.

A Russian company on the march with its ambulant kitchen fares about as follows: Before leaving camp in the morning, tea and bread; at noon, soup, with one-third pound of meat per man; at 4 or 5 o'clock, tea again; on arrival at the night camp, a thick soup, with one-third pound of meat.

The advantages of the ambulant kitchen are obvious. There are few places where it can not follow its company. On the march, when resting for the noonday meal, or on getting into camp it is not necessary to gather fuel and start a fire. The hungry soldier is not obliged to wait an hour or two for a hastily prepared and probably badly cooked dinner. If the company is divided into several detachments, the kitchen drives along and supplies soup and meat or hot water for tea wherever needed. The ambulant kitchen also doubtless provides the most economical way of preparing food, and this is of moment in the field, where it is so often necessary to reduce the ration. I believe that the experiences of the present Russo-Japanese war will convince the Russians more than ever of its great utility and induce other countries to adopt it.

Unfortunately for our service, soup is not properly appreciated by the American soldier. His distaste for it is doubtless the result of past experience, for cooking is a neglected art among the classes from which he generally comes, and soup requires careful preparation. But after a few demonstrations of what good, thoroughly cooked, palatable soup is his prejudice, born of ignorance, would soon be overcome. There is still the objection that everything is boiled: that there is no variety in cooking, except as to cereals or grits, which can be steamed on the false bottom, as explained. It is certainly better, especially in the field, to cook food well in one way than badly in several ways. Still the objection, which does not exist in the Russian service, might be a serious one with us. It can be easily removed, without affecting the efficiency and other advantages of the ambulant kitchen, by making certain changes in its construction which would enable the cook to boil, steam, and roast. Such developed kitchens are also manufactured, and a few were seen in the Russian service for the use of officers. They could easily be altered, if necessary; and made to answer all the needs of the American soldier.

STATISTICS.

The statistics so far published by the Russian and Japanese authorities are rather scant and doubtless much in need of revision. The information obtained outside of official sources is of some value, but seldom reliable. It is hoped that more satisfactory data will be published after the war, but it is well to bear in mind and take into account, in estimating the value of war statistics, the strong natural propensity for each side to minimize its losses and exaggerate those of the enemy. All that I can attempt now is to approximate the number of combatants and casualties at the principal battles as near as my information permits.

At Liaoyang (August 28 to September 5, 1904) the Japanese strength was about 220,000 and that of the Russians 190,000. The former admitted 17,539 casualties, namely, 7,681 in Oku's army, 4,992 in Nodzu's, and 4,866 in Kuroki's. The Russians admitted 16,000 casualties, namely, 4,000 killed and 12,000 wounded. The number of killed is probably near the reality, being confirmed by the Japanese reports, but that of the wounded is doubtless too low. It is a fair estimate to set the losses of the Japanese at 20,000 and those of the Russians at 18,000, making a total of 38,000.

At the battle of the Sha River (October 9 to 20), the Russians had 200,000 infantry and 26,000 cavalry, against about 250,000 Japanese. The number of casualties on the Japanese side, as officially reported, is 15,879 killed and wounded; it will be quite safe to raise this number to 20,000. On the Russian side it was announced from St. Petersburg that the wounded amounted to 43,868, and that the killed were estimated at 12,000, a total of 55,868 casualties. The number of killed is certainly not too high, and may be low, in view of the report of the Japanese staff that 13,333 had been left on the field. It is not improbable that many bodies were counted twice by the Japanese; but, on the other hand, bodies falling within Russian lines, or carried thither, could not be counted by them. There is seen to be an enormous difference in the number of casualties between the two belligerents. It is explained by the fact that the Russians took the offensive and did not succeed in dislodging the Japanese, who, much of the time, remained behind the shelter of their works and afterwards pursued a retreating enemy.

The next battle of magnitude is that of Chentanpu, from January 20 to 30, 1905, when General Kuropatkin, again taking the offensive, directed General Grippenberg to turn the left flank of the Japanese. The strength of Grippenberg's army was about 75,000, and that of his opponent, General Oku, 50,000. The movement was a failure, the Russians being obliged to retire to their old positions. The losses of the Russians are closely estimated at 12,000, including 2,400 killed, one-half of which were left on the field. The Japanese reported 842 killed and 8,014 wounded, a total of 8,856; as there were also 500 reported missing, we may safely raise their total of casualties to 9,000.

We now come to the series of engagements culminating in the evacuation of Mukden and Tiehling, waged from February 20 to March 16, 1905. Both armies had been considerably reenforced, the Russians putting 380,000 men in line, against about 425,000 Japanese. Never before had such immense forces been pitted against each other in civilized warfare. The total Japanese casualties, according to official sources, were about 11,000 killed and 46,000 wounded. The shells. Thus at Liaoyang, in certain exposed trenches, 75 per cent of the wounds were by artillery fire.

Some figures collected by a Japanese surgeon and published in the "Nippon" are interesting as showing the relative proportion of rifle and artillery wounds. At three fights around Port Arthur he ascertained that on the Japanese side 1,101 men were wounded by artillery and 3,025 by rifle, a proportion of 1 to 2.75, or 27 per cent. He remarks that even in the siege of a fortress the rifle is used on every possible occasion, often at short range, and always produces a preponderance of casualties. At four of the engagements near Mukden he ascertained that 725 men were wounded by artillery and 2,158 by rifle, a ratio of 1 to 2.97, or 25 per cent. The above numbers only refer to the wounded and take no account of the dead, but we know that of those hit by shrapnel a greater proportion are killed than of those hit by bullets; therefore if we take the greater number of casualties (killed and wounded) the percentage by artillery fire would be found still greater than as given above.

The same Japanese surgeon produces other figures which tend to show that, contrary to the opinion generally held, the Russians lost a smaller percentage of men by artillery than the Japanese, a difference resulting from the larger caliber and longer range of the Russian guns. What the Japanese lost by the inferiority of their guns they endeavored to make up by the accuracy and quickness of their fire and their ability to concentrate many pieces on one point.

It was roughly estimated by the military attachés and correspondents who witnessed these battles that at Liaoyang 50 per cent of the casualties were caused by artillery fire; at the Sha River, 33 per cent, and at Chentanpu, 12 per cent. According to Doctor Iline (Voenno Med. Journal, Dec.. 1904), of 1,170 wounded at the battle of the Yalu 86 per cent were caused by bullets, 13 per cent by shrapnel, and 0.5 per cent by hand grenades. Here again no account is taken of the killed.

The increase of artillery casualties has increased the proportion of grave wounds and of major operations in hospitals. It is doubtless true that the range and accuracy of modern artillery keep the firing lines farther apart, so that available statistics I find that the proportion of killed to the wounded in the Japanese army has been 1 to 4.5; in the Russian army, 1 to 3.96, and, in both armies together, 1 to 4.22. Doctor Wreden, medical director in chief, expressed the opinion (on or about March 5) that, so far as he had observed, up to that date the ratio in the Russian army was 1 to 4.5.

In siege operations, where artillery plays a preponderating part, we may expect a higher ratio of killed with respect to the wounded. Thus the estimate of Japanese casualties at Port Arthur (from Japanese sources) is given as 10,000 killed and 36,000 wounded, or 1 to 3.6; if this estimate is too low, we may assume that the error affects both killed and wounded to the same degree.

Among officers on the Japanese side the proportion of killed to the wounded at the battles of Chentanpu and Mukden was 1 to 4.58.

Comparing the ratio of casualties among officers to that among men, we find that on November 28, 1904, the wounded officers and men in all Russian hospitals were as 1 to 23. At the battle of the Sha River the proportion on the Russian side was 1 to 56. At the battles of Mukden and Chentanpu on the Japanese side it was 1 to 39.

Surgeons do not contribute a large quota to the list of casualties. Among the Russians, up to November, 1904, only 2 had been killed and 10 wounded; a few had been taken prisoners. Among the Japanese, up to October 22, 1904, 13 surgeons (2 first class, 3 second class, and 8 third class) had died of wounds or disease. According to the Japan Times of March 11, 4 were killed and 11 wounded in the battles near Mukden.

ARTILLERY FIRE.

The losses caused by artillery fire have been decidedly greater than in any previous war, but it is difficult, in the absence of official statistics, to form even an approximate estimate of them. In many fights the artillery fire kept the contending lines too far apart for effective rifle shooting; in such cases the majority of wounds would be from shrapnel

MEDICAL CORPS.

The medical faculty of the University of St. Petersburg is known as the "Imperial Military Medical Academy," and is the only military medical school in Russia. It has from 800 to 1,000 students, who wear a military uniform, with sword, and are subject to military discipline. Their average age at entrance is 18 years, the minimum age being 17. The curriculum covers a period of five years; it is exactly the same as that of the medical faculty of all other Russian universities. No special instruction is given in the technical field duties of the military surgeon nor in military surgery, medicine, or hygiene beyond what is part of the course of all universities. The first 7 of the graduating class are authorized to continue their studies during three years longer and obtain the doctorate, after which the most promising are sent abroad by the Government for special courses.

To give the students some experience of military life, those of the first year, before beginning the second year's course, spend two months in a military camp. The Imperial Academy is in a vast and well-equipped hospital containing all classes of patients, men, women, and children, so that clinical material is always at hand. The facilities for instruction—libraries, amphitheaters, laboratories, etc.—are very good and seem to compare favorably with any in Europe.

On graduating, the students are free to enter the army forthwith (without further examination) or go into civil life, as they may choose. Exception is made in the case of those (a rather large proportion) who had scholarships; they are under obligations to serve a year and a half in the army for each year of gratuitous instruction. Hardly one-half of the graduates enter the army, not nearly enough to fill up vacancies. But graduates from other medical schools may likewise be commissioned, and they form about one-fourth of the whole number of military surgeons.

Students of medical schools are exempt from all military service, but, upon graduating, if they do not enter the army, are placed in the reserve, where they remain fifteen years, being liable at any time during that period to be called for duty in the field as military surgeons. More than this, unless at the expiration of that period they make an official application to be discharged, they are carried on the rolls as volunteer reserve surgeons and still liable to serve. When called these medical reservists must start within five days. They enter upon their military duties with but little knowledge of them and no experience in their performance. In the present war the majority of surgeons sent to Manchuria are reservists, mostly married men, who have been settled a variable number of years as civil practitioners. Such men may be skilled surgeons and excellent physicians, but are necessarily unsatisfactory medical officers.

There are two medical degrees in Russia—the first, conferring upon the graduate the title and dignity of vratch or physician, which enables him to practice in any part of the Empire, and the doctorate, which may not be obtained until at least two years have elapsed since graduation. In the army, the doctorate helps in getting the first promotion; that is, the vratch who becomes doctor is at once advanced to the eighth grade of the Chin, which he could only reach otherwise after four years' service. All military surgeons wear, pinned to the left side, the Esculapian badge of twining serpents and laurel leaves—of silver for the vratch and of gold for the doctor.

The Russian military surgeon is not an officer, except by courtesy, but a military official or functionary. He wears the sword of the officer. His uniform, coat, trousers, and cap are of dark-green cloth, piped with scarlet. His shoulder piece, lined with silver lace, bears the bars and stars of his grade, but, instead of the officer's width of 3 inches, it is reduced to 2 inches. The white cockade on his cap and fur papahah is also smaller than the officer's and round instead of oval. In the field his relations with officers, so far as I noticed them, are harmonious and cordial and his services fully appreciated; but different are those relations in time of peace, in city life. Then it generally happens that officers regard military surgeons as belonging to a different class, declining to associate with them upon a footing of equality as brethren of the same uniform and excluding them from their clubs. Only three or four years ago the question whether military doctors were entitled to the military salute came up to the general staff for consideration; it was decided in the affirmative.

The Russian medical department does not yet possess complete autonomy, and it seems difficult, in high places, to get rid of the idea that, being a professional body, it is incapable of governing itself. Until recently it was entirely under the direction of staff and line officers. In 1903 a commission, appointed for the purpose, reorganized the medical service and gave it partial autonomy. Base and field hospitals, for instance, are now under the command of the chief surgeon, who has line officers under his direction for the discharge of interior administrative duties. On the other hand, transport columns, sanitary trains, the service of evacuation, etc., are still in charge of line officers. I believe that this war will tend to show the great evils of divided responsibility and that eventually the medical department will have full control of its personnel and material.

The young graduate entering the army takes his place in the ninth grade of the Chin—that is, the great hierarchy of civil functionaries—with the official title of "titular councilor." His shoulder piece is that of the army captain (longitudinal bar without star), but reduced in size. No examination is required at any step of his promotion. In four years he ascends to the eighth grade, becoming "college assessor," and in six years more to the seventh grade, becoming "court councilor," when he puts on the abbreviated shoulder piece of the lieutenant-colonel (the rank of major not existing). If, three years later, he occupies the position of regimental senior surgeon (not otherwise), he is promoted to the sixth grade, that of "college councilor," and puts on the shoulder piece of the colonel (two longitudinal bars without stars). Thus it is seen that the military surgeon in the Russian army reaches the grade corresponding to a lieutenant-colonelcy after ten years' service. Thereafter promotion is by selection, but the "college councilor" may not be promoted to the fifth grade and become "state councilor" (brigadier-general) in less than three years, nor the latter promoted to the fourth grade and become "actual state councilor" (major-general) in less than five years. It follows that the military surgeon may, and often does, reach the rank corresponding to that of major-general after twenty-one years' service.

The director-general of the medical department is of the third grade, "privy councilor" (lieutenant-general), and is the only member of the medical corps holding that high rank. The personnel of his office consists of 59 officials and 54 noncommissioned officers, privates, clerks, and messengers, besides a scientific committee for the consideration of technical questions. Quite a number of surgeons reach the fourth grade (major-general), whereupon their names are inscribed on the rolls of the nobility and entitled to the prefix of "excellency."

In the field the entire medical department, as well as the Red Cross Society, is under the command of a major-general of the line, an officer of presumed great executive ability. Next to him is the chief medical inspector (fourth grade), whose authority likewise extends over the several armies. Where their respective spheres of command and responsibility begin and end I am unable to say. Each army has a medical inspector (likewise fourth grade) acting under the high supervision of the chief inspector. These inspectors are generally military surgeons, but not necessarily so; thus the inspector of the First Army, while I was with it, was neither a doctor nor an officer, but one of the Emperor's chamberlains, appointed by General Kuropatkin on account of his well-known administrative experience in the Red Cross.

To direct and superintend the technical and professional work, there is a medical director in chief for the several armies and a medical director for each army, all with the rank of state councilor (brigadier-general). The chief surgeon of the corps is fourth grade (major-general); the chief surgeons of division and brigade are fifth grade (brigadier-general): the chief surgeon of the divisional sanitary service (including bearer company and hospitals) is likewise fifth grade. Regimental surgeons are sixth and seventh grades (colonel and lieutenant-colonel), while battalion surgeons are eighth grade (captain).

The relations of rank and duty, as in our service, are not strictly drawn. Within certain limits a man may be assigned to the duty he has shown himself fitted for, independently of his rank. He draws the pay of the position he fills, and therefore not necessarily that of his rank; thus, a battalion surgeon, with corresponding grade of captain, if detailed as regimental surgon, draws the pay of the grade corresponding to lieutenant-colonel. At a bacteriological station I visited two surgeons of grade corresponding to lieutenant-colonel were on duty. The senior, in charge, drew the pay of colonel.

The pharmacists in the Russian army, as in all other European armies, form a separate commissioned class of officials in the medical corps; they rank in the Chin from the fifth grade downward.

Formerly the veterinary surgeons also formed part of the medical corps, but since 1902 they have been properly separated from it. They likewise rank in the Chin from the fifth grade down.

We should also mention as commissioned personnel or officials on duty with the medical department the line officers, who, in field and base hospitals, perform the duties of commissary and quartermaster, as well as bookkeepers and chaplains.

HOSPITAL CORPS.

The hospital corps consists of feldshers, hospital sergeants, nurses, attendants, bearers, and transport men.

The feldsher, or aid-surgeon, is special to Russia. He is found not only in the army, but all over the Empire, practicing medicine and minor surgery wherever doctors are not available. There are five feldsher schools in Russia, the chief ones (each containing about 300 students) being in St. Petersburg, Moscow, and Kiew. The pupils are put through a three or four years' course of instruction and receive practical training in hospitals. In the army the feldsher's services are invaluable. There are senior, junior, and pupil feldshers, their grades varying according to their duties, as company, battalion, or regimental feldshers, the latter sometimes being raised to the fourteenth grade of the Chin, with privilege of wearing sword. The pupil feldsher is a man who, after serving one year or more in the ranks, is transferred to the hospital corps and trained in hospital, where he receives a course of instruction for three years; he may graduate as feldsher if able to pass the required examination. There is also the dispensary feldsher, particularly trained in the preparation and dispensing of drugs.

Hospital sergeants are mostly administrative and disciplinary noncommissioned officers, usually placed in charge of wards. Male nurses, generally poorly trained, work under the supervision of the feldshers and female nurses. Attendants and orderlies do the manual labor. In field and base hospitals hospital corps men wear the uniform of the fourth regiment of an infantry division (green collar and cap band), with the number of the hospital on the shoulder piece, followed by the first three letters of the word "Lazareth;" they also wear the Red Cross badge on the left arm, except the transport drivers, who carry hatchets and therefore may not be considered noncombatants. Bearers are of two kinds, regimental and divisional. They do not wear any distinctive uniform. They receive little or no instruction in time of peace and probably have not much opportunity to receive it in time of war.

There should also be mentioned, as part of the hospital corps personnel, clerks, cooks, bakers, and drivers.

The nursing in field and base hospitals is done chiefly by women, mostly trained nurses belonging to various Red Cross communities and known as "sisters."

COMPOSITION AND ORGANIZATION OF THE SERVICE OF THE FRONT.

This subject having been fully treated by various competent observers,[a] I shall merely sketch the outlines of it for the better comprehension of what follows.

A division of infantry consists of 2 brigades of 2 regiments of 4 battalions each, besides artillery and train, and numbers 18,019 combatants—namely, 383 officers and 17,636 men, a proportion of 1 to 46.

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[a] See articles of Col. Frank Howard in Journal of the Association of Military Surgeons, October and December, 1904; of Prof. Frederic Antony in Archives de Medecine et Pharmacie Militaires, February, 1903; and pamphlet by Col. J. Van R. Hoff, U. S. Army, on "Outlines of the Sanitary Organization of some of the Great Armies of the World."

When mobilized for active service, the medical personnel of a regiment of infantry (3,956 combatants) consists of 5 surgeons, 22 feldshers, 1 hospital sergeant, 3 male nurses, and 9 transport men. Its material consists of 4 one-horse carts for supplies, 1 two-horse wagon for litters (32 provided), and 4 four-horse ambulances, all following in the immediate rear of the regiment.

Litter bearers are detailed from the battalions when needed at the rate of 8 per company, 32 per battalion, and 128 per regiment.

The medical personnel of a cavalry regiment (700 to 1,000 combatants) consists of 2 surgeons, 6 feldshers, and 24 bearers, its material comprising 2 two-horse ambulances, 1 one-horse medical cart, and 6 stretchers.

The second line of help is formed, as in most European armies, by the ambulance hospital, an organization composed of two distinct elements, a large dressing station and a bearer company. Its personnel consists of 1 line officer in command, 5 medical officers, 1 overseer (official), 5 feldshers, 4 female nurses, 22 nurses and attendants, 2 clerks, 39 transport men, and 200 bearers, under 17 noncommissioned officers. Exclusive of officers, official, and female nurses, we have a total of 285 noncommissioned officers and men. As material, it has 27 vehicles, including 8 ambulances, and 4 large tents.

The third line of help is formed by the field hospitals. Each division of infantry in active service is allowed 2 field hospitals, each capable of accommodating 10 officers and 200 men. One immediately follows the division with the ambulance hospital; the other is half a day in rear with the second echelon of the division train. Two other field hospitals per division of exactly the same capacity and composition are also mobilized, but remain at large, so to speak, under the direction of the inspector-general of the army.

The personnel of the field hospital consists of 1 chief surgeon in command, 4 surgeons, 1 pharmacist, 2 line officers as quartermaster and commissary, 1 bookkeeper, 1 chaplain, a total of 10 officers and officials; also 10 feldshers, 3 clerks, 1 sacristan, 4 female nurses, 1 hospital sergeant, 1 quartermaster-sergeant, 63 nurses and attendants, and 28 transport men, a total of 107 noncommissioned officers and men. The material comprises 25 vehicles, namely, 19 two-horse wagons, 1 four-horse wagon for heavy parts of tents, 4 one-horse medical carts, and 1 four-horse carriage for female nurses; also 210 bedsteads, 105 small tables, 40 stretchers, bedding and clothing for 210 patients, 3 large tents, 24 small tents, etc.

The kind and number of vehicles used were quite variable, and the personnel would change accordingly. Thus in the eighth field hospital the hospital corps consisted of 9 feldshers, 1 sergeant-major, 5 sergeants, 25 attendants, first class, 34 second class, and 50 drivers; while the wheeled material was made up of 50 one-horse carts—42 for baggage and 8 for medical supplies.

Besides the above three lines of organized help we may also count as in the service of the front the 20 transport columns, "sanitary convoys," or about one for each corps actively engaged, which, according to regulations, are provided as auxiliaries for the removal of the sick and wounded from the battlefield to the rear. Officially, each consists of a line officer in command, 1 line officer as commissary, 2 surgeons, 5 feldshers, 2 clerks, 2 female nurses, 19 attendants, and 68 drivers, under 3 noncommissioned officers, a total of 97 noncommissioned officers and men; while its material comprises 36 vehicles, including 27 ambulances. But its composition is subject to many variations. Thus the perfectly equipped transport column I saw at Kuanshan (headquarters First Army) had a force of 173 noncommissioned officers and men, with over 100 carts and 9 mule litters.

For convenient reference we may present the above enumerations in a tabular form, as follows:

	Officers and officials.	Feldshers and clerks	Sergeants, nurses, attendants, etc.	Litter bearers.	Transport men.	Total.
Regimental organization....	5 surgeons.................	22 feldshers...............	4 (1 sergeant, 3 male nurses).	128	9	168
Ambulance hospital	7 (5 surgeons, 1 line officer, 1 official).	7 (5 feldshers, 2 clerks)..	26 (4 female nurses, 22 attendants).	217 (17 noncommissioned officers, 200 privates).	39	296
Field hospital	10 (5 surgeons, 2 line officers, 1 pharmacist, 2 officials).	13 (10 feldshers, 3 clerks).	70 (2 sergeants, 1 sacristan, 4 female nurses, 63 attendants).	....	28	121
Transport column...........	4 (2 surgeons, 2 line officers).	7 (5 feldshers, 2 clerks)..	21 (2 female nurses, 19 attendants).	....	71	103
Total	26	49	121	345	147	688

To obtain the strength of the medical personnel of a division 18,000 strong we must first multiply the regimental organization by 4, that of the field hospital by 2, and then add the ambulance hospital and transport column. The result is a grand total of 1,313, namely, 51 officers and officials, 14 female nurses, and 1,248 noncommissioned officers and men. A hospital corps of 1,262 would give a proportion of exactly 7 per cent of the combatants, which is ample; much greater than that of any other European or American army. But we have counted a whole transport column in the medical strength of a division, whereas, in reality, there is hardly one column to each corps in active service, so that we should deduct at least half a column, or 48 men, from our computation, thus reducing the percentage to 6.7. But, on the other hand, we have seen that 4 field hospitals are mobilized for each division, although only 2 are attached to it. It is presumed that the other 2 can also be put to its credit when in presence of the enemy, in which case the grand total rises to 1,436 noncommissioned officers, nurses, and men, or a percentage of 7.96, which, according to all authorities, is unnecessarily large.

Concerning medical officers, on the basis of 4 regiments, 1 ambulance hospital, 4 field hospitals, and one-half transport column, we obtain a total of 46, or a ratio of 2.55 per 1,000 combatants. This is hardly enough for the efficient service of the front, but if we bear in mind the valuable technical assistance given by the feldshers the deficiency may be overlooked. However, we assume that the medical corps of 4 field hospitals is present and available, but this was rarely the case.

As will appear hereafter, the full complement of officers and men during the present war in Manchuria was not always present, and, not infrequently, personnel and matériel fell below what is strictly necessary for efficient work. The difference between the letter of the regulations and the extent to which they are carried out in practice seldom fails to exhibit itself in any war, and it is certainly evident in the Russian service. Thus, for instance, ambulances are entirely absent in the field, being replaced, so far as replaced at all, by carts and other unsuitable vehicles.

FIRST AID AND SERVICE OF THE FRONT.

Each regiment is followed by its medical personnel and matériel. As it goes into action a place is selected for the dressing station. This was almost always in the nearest village or compound, the mud walls of the buildings affording reasonable shelter against rifle bullets and shrapnel. The hard, frozen ground made it easy for the medical carts to find their way to the dressing station, but some were often missing. However, thanks to the pouches carried by the feldshers as well as the first-aid packets of patients, the supplies, especially dressing material, appeared to be adequate. Occasionally, owing to regimental changes of position, one or two subsidiary stations would be established.

Officers and men are required to carry a first-aid packet on their person. So far as the men are concerned this order is not carefully observed; furthermore, there seems to be no definite place prescribed for it; most soldiers have it in one of their trousers pockets, together with many other articles, so that it gets very much soiled and is always in danger of being lost. It is about 3½ inches long, 2½ wide, and 1 thick. It contains 2 sublimated bandages, gauze, cotton-wool compresses, and safety pins, the bandages and gauze being colored pink. All men are supposed to receive some instruction in applying it, but I was not able to ascertain to what extent this had been done.

The regimental surgeons do not follow the men into the fight. They remain at the dressing station, together with the feldshers and nurses. Therefore the only help given on the line of fire is by comrades or litter bearers.

Bearers do not form part of the regular medical personnel, and probably are always an uncertain quantity. As in all other European armies, they are men temporarily detached from their battalions, who at the beginning of a battle report to the surgeon at the dressing station. Eight bearers, or two litter squads, are thus detailed from each company, making 32 per battalion and 128 per regiment. They leave their equipment near the medical carts, and, each squad of 4 taking a litter, advance to the battlefield, give first aid to the wounded, so far as practicable, and bring them to the dressing station.

The bearers of each regiment work under the direction of a single line officer, assisted by 1 noncommissioned officer from each battalion. They mess with their respective companies.

Stretchers for the regimental bearers, instead of being brought to the front in the battalion medical carts, as in the French system, are carried in a special two-horse wagon, 32 being thus provided. This is necessary on account of the bulk and weight of the Russian stretcher, while with the lighter and otherwise much better litter of the French it is clearly advantageous to save the additional vehicle. This stretcher wagon was not often seen, and litters were always so very scarce that I doubt if there was anywhere a full complement of them. However, let us render justice to those bearers who had litters and were sent to the front. From all accounts they did their duty bravely, being easily seen among the line of combatants, a good target for the enemy.

Whatever may have been the activity of the bearers, a majority of the wounded would still find their way to the dressing station on foot, helping each other or helped by sound comrades who left the ranks for the purpose, and resting in every sheltered spot.

The usual manner of carrying the loaded litter in the field in the Russian army (as well as in the Japanese and French armies) is by 4, on the shoulder, a mode of carriage especially cautioned against in our service on account of the great danger to the wounded in case of a bearer tripping, stumbling, or falling. Such accidents to the bearers, with fall of patient to the ground, happened rather frequently, I was informed, on the rough, rocky hills, where many engagements were fought, especially when rendered slippery by frost.

Improvised litters, generally clumsy and heavy, were often carried by 6 men, either on shoulder or at arm's length. Whether carried by 4 or 6 men, it was not unusual to see a few extra men marching along to take the place of the tired bearers. All this reminded me forcibly of our own experience in Santiago de Cuba in 1898.

Litter slings appear to be unknown; at least I have not seen any except a few improvised ones made of rope.

As already stated under the heading of organization, the strength of the hospital corps for the service of the front as provided by regulations is ample, ranging from 6 to 7 per cent of the combatants. There must have been something wrong in the carrying out of the regulations. It is possible that the field hospitals "at large" were not mobilized or sent to the right places, thus reducing the divisional strength of the hospital corps by 222 men. It is also probable enough that all the regimental bearers were not turned out; few battalion commanders think of parting with 32 combatants at the beginning of an action, unless compelled by the habit of strict discipline. And all these possible irregularities were certainly accentuated in the medical work of the front by the lack of authority and, therefore, the sense of irresponsibility of military doctors who are not officers, as well as by the lack of experience in field work of a majority of them, namely, those coming from the reserve.

At the dressing stations I visited I noticed a general laxity of discipline and want of organization, as if nobody was in command and responsible. The work, however, if rather slow appeared to be well done and in accordance with modern principles, so far as these principles are capable of application on or near the battlefield. The best work I saw on the first line of help as to quantity and quality was done by an advanced Red Cross column. It is useless to say that this primary treatment was necessarily of the simplest kind, seldom more than the application of the first-aid packet and of splints in case of fracture. No attempt was made to wash or otherwise sterilize wounds. I do not remember seeing a single tourniquet put on for hemorrhage. No effort was made to tag the patient, although I believe it would have been quite practicable to do so.

The functions of the divisional ambulance hospital (in the Russian and all other European services) is to form a main dressing station and, by means of its bearer company, to help the regimental bearers in removing the wounded from the battlefields. As soon as these have received first-aid treatment it carries them to the field hospitals. In reality, with a well-equipped service, a second and larger dressing station, between the first-aid stations and the field hospitals, is entirely unnecessary; a patient once loaded in an ambulance or other suitable vehicle should not be unloaded until he reaches the field hospital. In Manchuria the first dressing stations are almost always near roads and readily accessible. Unfortunately ambulances were absent and the vehicles used of the most unsuitable kind; every wounded man who could walk or in some manner drag himself along avoided them. Under such circumstances a second dressing station or ambulance hospital where men could rest, get restoratives, and have their dressings overhauled would be very useful. These ambulance hospitals were seldom established, and the organization generally reduced itself to the bearer company.

It must be admitted that the three most important duties of the medical department at the front are the collection of the wounded, the application of first aid, and their transport to field hospitals. As a general rule, the wounded found their way or were helped to the dressing stations. A majority received first aid there and many others at the field hospitals. It is said that in the early days of the war a certain proportion of wounded were carried as far as Mukden, or even north of it, without primary treatment and remained several days before receiving it. In the Harbin hospitals I saw patients who had been between one and two weeks without medical attendance. On the train which carried me to Dalny were two wounded Russian prisoners, who stated they had been four days on the field (near Mukden) before being attended to. I doubt whether this can be avoided after pitched battles between powerful armies, when casualties amount to one-fourth or one-fifth of the combatants, especially as regards the defeated side, for however magnanimous may be the victor, he will collect his own wounded which are nearest before he searches the more distant field of the enemy. As to the means of transport from dressing stations to field hospitals, they were woefully lacking and defective. There were few available stretchers and no ambulances. On the dusty roads one met limping patients painfully struggling along, occasionally a litter with a wounded officer, but oftener improvised stretchers of poles and rope or of rifles and slings.

During the various engagements of the battle of Mukden the bearer companies and transport columns which came under my observation appeared to me strangely careless and inactive. Thus on March 7, west of Mukden, a mile from the railway station, was a bearer company at rest. Two miles farther was a large dressing station with patients rapidly accumulating. Two or three hours later, returning on the same road (covered with straggling wounded), I found the same bearer company still resting and expectant. The next day I visited another dressing station, north of Mukden, a mile or so beyond the Imperial Tombs. I left it at about 2 p. m., and on the road going south overtook many groups of wounded resting by the wayside or plodding along. The fighting at that place and to the left and right of it had been going on the whole day, but the first transport column going in that direction—that is, means of transport of any kind, in the shape of Russian and Chinese carts, most brutal vehicles for the purpose—was not met until 3 p. m., still several miles from the field. An hour later, near the Khukha Tower, about 5 miles from Mukden, I found another transport column, or bearer company, halted, with most of its carts and mule litters loaded. It seemed imperative that it should at once proceed to Mukden, where were the nearest hospitals, unload the wounded, and return for a fresh load. It had been apparently at rest for some time before my arrival, and when I left, half an hour later, there was no sign of any preparation for moving. The best equipped transport column I have seen was at Huanshan, the headquarters of the First Army; on March 2 it was still encamped and lying idle there, although there was fighting going on along the whole line.

I believe that this want of diligence and activity, betraying incompetency and defective organization, is chargeable to the line officers who are in command of the means of transport. Medical officers probably could not help it, and, furthermore, they have never been encouraged to assume any responsibility beyond their specified duties.

The absence of the ambulance wagon is entirely inexplicable; nobody seemed to know of any satisfactory reason therefor, or to care much about it. Russian surgeons were strangely indifferent as to the desirability or importance of such a vehicle. It is true that the Russian ambulance is large, heavy, and wide gauged, but it could have been used on the hard winter roads without difficulty. Even the few that were shipped to Manchuria were hardly ever tried.

It is also worth noting that the Japanese, so far as I am correctly informed, are likewise destitute of ambulances. With them I presume it is simply a question of economy. They make up the deficiency to a great extent by great quantities of litters and large detachments of Chinese coolies impressed and used as bearers.

The example of Russia and Japan does not, in my opinion, in any way tend to discredit the ambulance or show its impracticability in the field. On the contrary, I do not know of any winter campaign where it could have been used to better advantage. But I think it shows a tendency to reduce the size and weight of all the vehicles of an army, and brings up the question whether a light ambulance, for two recumbent patients, is not preferable to the usual larger pattern, considering the various conditions of terrain and climate.

To take the place of the ambulance the small, springless cart, or dvukolk, shipped in large numbers to the theater of operations as a convenient vehicle for suplies of all kinds, was also required for the transport of the wounded, but, as before explained, it has none of the qualities of an ambulance; it is as rough a vehicle as can be devised, and even badly wounded men loaded into it often begged to be let out, if at all able to stand.

No fault can be found with the horse litter; all patients carried in it speak well of it. Its only objection is that it requires two animals and two drivers for each patient, and therefore can never be used for a large number of men.

Several Red Cross organizations brought with them light ambulances of different patterns; only the Finnish ambulances were in sufficient number to do good service. Those of the Hesse hospital arrived at Mukden only a few days before the evacuation of that city.

From February 25 until the evacuation of Mukden, on March 9, groups of wounded men on foot reported constantly at the distribution hospital near Mukden, often after marches of many weary miles, and daily arrived also columns of Russian and Chinese carts full of patients suffering from every variety of severe wounds, crowded and jostled in all sorts of irksome and distressing positions, their sufferings still aggravated by the intense cold and whirls of thick dust. The groans and lamentations from these vehicles were heartrending to anyone whose sensibilities had not been blunted by the habit of such scenes. Frequently men were found dead on arrival.

The distribution hospital was a large, commodious, and well-heated dugout, but insufficient for its purpose and without facilities for the segregation and classification of patients. The great majority of the wounded coming to this hospital had a primary dressing on. The tag system was nowhere attempted. An effort was made to register them as they entered, but this could only be imperfectly done for want of room and personnel, for the work was incessant and would have required at least two complete shifts to be done well; that is to say, at least twice as much personnel as was available.

FIELD HOSPITALS.

The great number of villages scattered through Manchuria made the establishment of field hospitals comparatively easy. Half a dozen adjoining houses, with annexes, would answer the purpose. The brick or mud walls and thatch roofs, with few repairs or additions, afforded adequate protection against cold and dust. As a rule the various departments of the hospital were conveniently installed, with plenty of water from the wells, a sufficiency of wood for fuel, and practicable connections with the supply depots. The khans made convenient platforms for beds, but as a mode of heating were seldom acceptable. Russian brick stoves were generally built in the main rooms.

Three large tents, each for 20 patients, and a few smaller ones for 2 patients, are part of the material of the field hospital, but in winter, owing to the difficulty of heating them, were not used. The large tents, as before noted, are entirely too heavy and cumbersome for their purpose and only fit for use at permanent hospitals.

The first line of field hospitals was at places of election, 2 or 3 miles in rear of the firing line. A second line was placed

10 or 12 miles farther back for the overflow of sick and wounded, always as near the railroad line as possible. All field hospitals in the same army are numbered consecutively, whether or not attached to divisions. Thus the eighth hospital (on the advanced line) was attached to the Fifth Division, Second Corps, First Army, while the thirty-third and thirty-fifth (on the second line) were hospitals at large.

At the eighth field hospital, while at Huanshan, near the Sha River, the monthly expenses, including salaries, food of personnel, lighting and heating, and rental of the premises from the Chinese owner, amounted to $5,830. To this sum should be added the cost of the patients' food, for which the allowance was 30 cents a day for men and 60 cents for officers.

Before the battle of Mukden the field hospitals had been established such a long time in the same places that they had assumed the character of stationary hospitals and acquired facilities for operative surgery which field hospitals rarely possess. Thus the eighth hospital up to January 1 had performed 6 amputations, 3 laparotomies, and 56 other, mostly minor, operations. Since the beginning of the war up to the above-mentioned date it had admitted 107 officers and 3,261 sick and wounded. On the day of my visit (February 25) a patient with perforating wound of the abdomen was brought in, and in the evening laparotomy was decided. The operating room was large, clean, and equipped with all necessaries. Matting was spread out over floor and khans. Cotton sheeting covered the ceiling. Good light was furnished by the "stop" incandescent portable lamp, manufactured by Jokim, of St. Petersburg. This lamp gives a bright, white steady light, produced in two or three minutes with any kind of alcohol, and can be held in any position. The operation in question lasted one and one-half hours, three perforations being successfully closed. Morphine and chloroform were the anæsthetics, and it was difficult to keep the patient alive to the end.

It is not customary to perform serious operations in temporary hospitals under ordinary circumstances, but it is a rule with many exceptions. Whenever such hospitals are situated like hospital No. 8, above mentioned, with all necessary facilities and a skilled operator, it would seem better to perform a laparotomy, for instance, when the symptoms show it to be the only hope and last resort, than to subject the patient to the jeopardy of a rough ride of many miles to a base hospital. Doctor Oettingen, of Berlin (Professor Bergmann's assistant), directed a field hospital near the railway station at Mukden. On March 6, while visiting his operating room (in a neat Decker portable pavilion), he called my attention to a patient just brought in on a stretcher. "I do not believe in performing laparotomy in field hospitals," said he, "unless one is obliged to, as in this case," and, lifting the dressing, showed me a large lumbricoid worm crawling out of the wound. The torn intestine was successfully repaired with a Murphy button. However, it must be remembered that the best surgeons are generally at the base hospitals, and that in field hospitals young surgeons are prone to undertake operations which may add to their experience, but are not always to the advantage of patients.

In field hospital No. 15 the usual mode of dressing was described thus:

> The skin is cleaned all around the wound with brush, soap, and alcohol, and a simple compress of aseptic gauze applied, always avoiding to touch the wound with the fingers. In case of infection the compress may be dipped in sublimate solution, but even then the simple aseptic compress is often preferred.

The number of field hospitals provided by the regulations, namely, four to a division, when all are available (which is far from being always the case) accommodates less than 5 per cent of the combatants, and at first sight may seem inadequate. But I do not believe that in this respect any European service makes more liberal provisions, and furthermore I doubt the necessity of doing so. The capacity of a field hospital is of much lesser moment than the number and quality of its personnel and the transport facilities thence to the rear, for most wounded brought to the field hospital, after receiving an efficient dressing and resting a few hours, are able to continue their retreat, either on foot or in a vehicle. The question, then, is not so much how many can the hospital accommodate, but rather how many can its personnel attend to and speed on to the rear. In Manchuria the shortcomings of the advanced field hospitals were mitigated by the setting up of other hospitals at favorable points farther to the rear and the facilities of evacuation by rail. Still it must be admitted that after the battles of Liaoyang and Sha River many wounded reached Mukden and even Harbin without any primary dressing.

An interesting question is the number of patients, taking them as they come, which can be dressed by one surgeon in a given time. This must necessarily vary within wide limits. The ambulance hospital of the Second Division, Fourth Siberian Corps furnished the following information: At Liaoyang, 20 surgeons worked eight hours and attended 1,500 wounded, a ratio of 9⅓ wounded an hour, per surgeon. No operation of any importance was performed, but many fractures were secured and extensive shrapnel wounds dressed. On the Sha River, September 28, the same hospital received 700 wounded, but the 4 surgeons present, working eighteen hours, could only dress 450, or 6¼ per hour, the remaining 250 being evacuated without dressing. After the battle of the Yobe, the Fifteenth field hospital received 1,036 wounded, giving 115 to each surgeon working twenty hours, or at the rate of 5.7. From all the above statements it would appear that little had been done at the dressing stations in the way of effective primary dressing, and that many patients arrived directly from the battlefield without any first-aid treatment.

In closing this subject, I should say that, as a rule, the supplies were sufficient, and the medical attendance, nursing, and feeding as satisfactory as could be expected under the circumstances. The excellent services of the female nurses were nowhere more conspicuous than in the field hospitals.

STATIONARY AND BASE HOSPITALS.

In February, 1905, while the belligerent lines were facing each other on the Sha River, the nearest permanent hospitals were at Mukden, and into them the stream of the sick and wounded flowed intermittently. North of Mukden groups of hospitals were located along the railroad at Tiehling, Kunchuling, and Harbin. Beyond Harbin the most important hospital centers were at Nikolsk, on the east, and, always on the railroad line, at Nonni River, Manchuria City, Chita, and Irkutsk on the west. Most of these hospitals were installed in very substantial and roomy barracks only recently built for troops, most of them never occupied and readily adapted to hospital purposes. Others were in equally good brick and stone houses, erected in great number and with magnificent liberality by the railroad company for its employees. Besides the above buildings, a large number of substantial frame pavilions were also erected for hospital purposes at many places where barracks and other structures were absent or insufficient.

There were times, before the close of the year 1904, when the installation and operation of hospitals met with serious difficulties owing to want of supplies and personnel. This is readily inferred, for instance, from the following extract from a letter published in the Military Medical Journal of St. Petersburg, December, 1904, describing the work of a base hospital established at Tiehling, June 20, 1904:

> There was a lack of everything, especially of personnel, which was reduced to 2 surgeons, 5 female nurses, and 8 male attendants. All the care required by 200 wounded devolved upon 2 nurses, and 6 attendants, * * * 4 nurses worked in the linen room, took charge of the pharmacy, and helped in the operating room. The attendants were partly Chinese and partly Russian, the former did not understand Russian, while the latter were nearly always drunk.

From a correspondent's letter, describing conditions in Mukden during and after the battle of the Sha River, the following is pertinent:

> The wounded commenced to arrive at Mukden on October 11, and the heaviest day was October 16, when the main road leading to the city was absolutely choked with ambulances, carts, and litters. * * * Still the facilities were miserably inadequate. A large portion of the much-needed hospital supplies were not forwarded to Mukden, the result being that the Red Cross was handicapped in every way. Train loads of wounded were sent direct to Tiehling, and all who could bear the journey were shipped to Harbin, but there remained thousands of cases which required immediate attention, and these were ordered to Mukden. The doctors have been practically without sleep for a week. Several nurses are reported to have actually died of exhaustion. * * * The supply of medicines and surgical appliances has run short. It is estimated at at least 28,000 wounded have been treated at Mukden. Scores of them have died before surgical assistance could reach them.

The long period of comparative rest which followed the battle of the Sha River enabled the medical department to complete and improve its organization, so that with the opening of the present year conditions were much more favorable for the sick and wounded.

In Harbin during the time of my visit (January 18 to February 3) all available buildings had been converted into hospitals—barracks, hotels, clubs, theaters, workshops, etc. A very fine hotel, just completed, with all modern conveniences, made an excellent hospital for officers. The extensive, nearly finished workshops of the railroad company were turned over to the Red Cross Society, which converted them into very commodious hospitals. Most of the regular military hospitals were located in the numerous barracks erected between new and old Harbin. It was calculated that in the three nearly contiguous towns making up Harbin (old town, new town, and port) 30,000 patients could be taken care of, namely, 6,050 by the Red Cross, in 24 hospitals, and 24,000 by the medical department, in 60 or more hospitals. But this was evidently deemed insufficient, for in that city the construction of hospital pavilions never ceased during the winter. These pavilions were substantial and comfortable. The walls consisted of two thicknesses of board about 6 inches apart, the interval filled with earth; the interior surface was covered with felt, then lathed and plastered, while the exterior was clapboarded. The roofs were all of Chinese tile.

In New Harbin the Central Hospital, near the railway station, originally intended for railroad employees and families, but then used for all classes of civilians, covers extensive grounds and presents quite an array of fine buildings. Unfortunately its internal arrangements have never been perfected, the water supply and sewerage system being very inadequate.

The largest and best equipped Red Cross hospital I have seen is that of the nobility (Dvoriansky), in New Harbin, consisting of 9 pavilions built for the purpose, each for 45 or 50 patients, with bathroom and water-closets. The personnel includes 68 female nurses and about 150 male attendants. The water is pumped from a well into a tank, filtered through charcoal before distribution, and boiled before being used. The method of filtering is more than open to suspicion, and, I believe, adds nothing to the purity of the water. The hospital has its own electrical plant and a fine X-ray machine. The disinfection plant consists of three parts—a steam chest, set of bichloride casks, and crematory, all under the same roof.

The hospitals of the Red Cross are of various kinds, all represented at Harbin and Mukden—namely, those directly managed by the society, those organized by provincial governments or municipalities, those of the nobility, and those supported by individuals. Thus, for instance, at Old Harbin, in a music hall, was the Warsaw hospital, maintained by that city for Polish soldiers and directed by a professor of the University of Warsaw; also, in a club, the Sisters' Hospital, supported by Her Majesty the Empress, for sick female nurses, and in a barrack, the Shuvalov Hospital, maintained by the Countess Shuvalov and directed by a professor of the University of St. Petersburg.

All Red Cross hospitals and other Red Cross organizations are under the direct control of the president of the society, or his delegates, to whom they render all professional and technical reports, but the society itself, so far as its operations are concerned, is under the control of the inspector-generals of the medical department.

Until recently military hospitals were always in command of line officers, and medical officers strictly confined to their professional duties; but the objections to that system were so obvious that shortly before this war an important change was made in this respect and greater authority given medical officers. To-day the chief surgeon is the commanding officer of the hospital, with complete control over personnel, management, and expenditure. The line officers who attend to the administrative work are under his direction.

As a general rule the military hospitals are neat and clean, well lighted, and comfortably heated by large brick stoves, the windows always double, but without ventilating panes. The floors were sometimes asphalted and painted, but generally boarded, without any attempt at oiling or polishing, and resting on the ground, without any ventilation underneath. The most serious defect of these hospitals is the absence of waterworks and water-closets. The substitutes—

vaults, latrines, removable tubs, or cans, pails, etc.—were generally defective, insanitary, and did not come up to our standard of what could or should be done under those conditions. The original system in the barracks often consisted of sheds, with seats over iron carts, which received the excreta and carried them off; but this system, intended for soldiers, was seldom available for patients, and very uncomfortable for anybody in winter. Bathing facilities were quite limited. The always practicable and economical shower bath was not seen. In several hospitals were the popular steam baths, of which all Russians are fond, but which are of little use to patients.

The largest hospitals were furnished with X-ray machines (hospital No. 3 with one giving a 20-inch spark and making fine skiagraphs), old-pattern steam disinfection plants, and simple but sufficient portable bacteriological laboratories.

The beds are of various kinds; most of them appeared to have been improvised, chiefly narrow, wooden bedsteads with straw tick, pillow, sheets, and blankets. These beds are necessarily crowded, regardless of all hygienic principles, the clear floor space between and around them being generally less than the area actually covered by them, each bed seldom having more than 30 square feet of floor space. To economize space and furniture beds are often arranged in sets of twos (the two beds of the set contiguous) with a small table between the sets, each table for the two adjoining beds. The result of this crowding is that when a majority of beds are occupied the ventilation is almost always bad, especially in winter, when loss of heat is carefully guarded against at the expense of natural perflation. I have entered wards where the fetid atmosphere, complicated with tobacco smoke, seemed to me irrespirable, although the patients did not seem to be inconvenienced, nor did the Russian officers accompanying me express any surprise or give sign of discomfort. It should be stated that the Russian soldier is patient and submissive to the point of stolidity. When sick he accepts his sufferings and discomforts uncomplainingly, giving but little trouble to his attendants, who, on the other hand, may, on account of his silent resignation, overlook his serious condition.

The supplies of dressings, appliances, and instruments were generally sufficient and of good quality, admitting of ready sterilization. Many came from Paris and Berlin, although most were furnished from the Government manufactory in St. Petersburg. Some of the old-pattern instruments with wooden handles were still in use. Sets of instruments were often in ebonite casing, a composition said to be liable to crack in boiling water. A distinguished Russian surgeon, in letters to a medical journal, complained that there were not enough hæmostatic forceps and that he had no apparatus for normal salt injection.

The food of patients seemed to be good and well cooked, including meat, poultry, bread (black and white), vegetables, cereals (oatmeal, rice, sago, etc.), fish, eggs, milk, jam, kisel, etc. Milk, costing 40 or 50 cents a quart, is something of a luxury. Fish and eggs were also difficult to procure. Tea, with sugar, of good quality and well made, is the ordinary beverage.

The allowance for food in military hospitals was 30 cents a day for men and 60 cents for officers. In some hospitals large savings were made. The cook may be one of the attendants, in which case he is paid $25 extra per month, or else a civilian (generally Chinese) hired for the purpose. The total costs of patients to the Government is estimated at $1.25 per day. The cost of food is about the same or a trifle higher in the Red Cross hospitals. In one of these, where special attention was given to cooking and dieting but managed on a strictly economical basis, the cost was 20 cents per day.

The Red Cross hospitals, in a general way, appeared to be more comfortable and better managed than the regular military hospitals, possibly because of ampler means. Their personnel for each 100 patients was 2 to 3 surgeons, 6 to 10 female nurses, and 12 to 20 attendants. The number of female nurses was greater but that of feldshers smaller than in military hospitals. There was the same overcrowding of beds. These were of all types, mostly of iron with wire bottom, but a large proportion with board bottom or with the Chinese rope bottom. Straw ticks likewise took the place of mattresses. In the hospitals supported by the Empress

Dowager, at Harbin, the bedsteads were of iron, with canvas bottom, which could be tightened as desired; a canvas bag on each vacant bed contained fresh hospital clothing, to be put on by the patient when admitted, and received his own personal effects.

In all these hospitals, military and Red Cross, earnest efforts were made to apply the principles of modern surgery. The operating rooms were well located and equipped with simple, inexpensive, but adequate material. Separate rooms for the dressing of wounds were used whenever practicable. As good asepsis as possible was always aimed at, and, on the whole, with gratifying success. The chief surgeons are all men of mark. In the Red Cross hospitals can be seen many of the most distinguished surgeons of Russia. The nursing could not always be good, owing to the crowding of patients and the marked inaptitude for it of the Russian male attendants, but the knowledge and zeal of feldshers and female nurses prevented it from ever being very bad.

The Mukden hospitals showed the Russian medical service under the stress of war, when its efficiency was severely tested. It is chiefly to them that the following remarks apply:

The operating table consisted almost invariably of two plain narrow deal tables, the one corresponding to the head shorter than the other, set end to end. When necessary to bandage the chest or abdomen, the tables were drawn apart so as to leave the necessary gap between. Such efficient simplicity highly commends itself. Much of the gauze first supplied was sublimated and tinted rose. It was found objectionable not only on account of its irritating quality, but also because it masked the inflammatory redness and made it difficult to appreciate its extent and import. Doctor Wreden has proposed to replace the sublimate by creosote whenever an antiseptic gauze is needed. An advantage of creosote is that it keeps flies away, a matter of importance where flies abound, as in Manchuria. Doctor Oettingen spoke highly of collargol, which he employed in the shape of small pellets dropped in the corners of infected wounds, but other surgeons who had given it a trial ended by discarding it. No iodoform or antiseptic of any kind was used as a rule.

Plain sterilized gauze was generally preferred, even in septic wounds. Irrigation was not countenanced, dry dressing being resorted to whenever possible. Absorbent cotton was freely used, and so was the cheaper lignine, made from birch bark, a soft elastic substance more hygroscopic than cotton and less likely to become incrusted upon the wound. In Russia it costs only 17 cents a pound. After the dressing is completed Professor Butz is in the habit of marking the date of application and any other useful information upon it with an aniline pencil, a device eminently practical. Plaster of Paris was never used, not because it was not valued, but apparently because it was not supplied. Immobilization was mostly obtained with thin pasteboard splints and starch bandage. No felt or wire splints were seen in hospitals or at the front. In a campaign where so many wounded had to be transported hundreds of miles before finding their final resting place it seems regrettable that plaster of Paris was not used, and freely used, especially in field hospitals.

Chloroform is the invariable anææsthetic in all the Russian hospitals I have seen, often preceded by a hypodermic of morphine. Doctor Butz, of the University of St. Petersburg, one of the most efficient hospital chief surgeons in Mukden, claimed that in his professional career he had used chloroform in at least 15,000 cases without accident.

The cleaning of the hands and arms of the operator and assistants was dóne with brush, soap, alcohol, and sublimate, and the toilet of the patient attended to as well as possible. There was not the same scrupulous care in the observance of these preliminaries that would have been the case had patients been fewer and time longer, but every essential requirement was heeded, and the results appeared to be very satisfactory. The surgeons did not wear caps, nor did they use rubber gloves. This last omission was doubtless a serious fault, unless made necessary by reason of economy, for I can not imagine any kind of surgical work in which gloves would be more convenient and beneficial.

Many wounds of the head were brought into the Mukden hospitals, and trephining was a common operation. It was usually done with chisel, mallet, and cutting forceps. Hernia cerebri frequently resulted from such wounds, but under plain aseptic dressing it generally went down to complete recovery.

As already noted, infection of wounds was very common in winter owing to thick clothing and dirty skin, especially in patients left several days unattended, but even such wounds responded nicely to treatment, so that cases of gangrene, erysipelas, and septicemia were rare, while tetanus was hardly ever seen. On account of this tendency to infection it was a common practice to incise all wounds showing signs of inflammation and suppuration very freely and let them heal by granulations with daily dressings. To prevent the infection of wounds, especially bullet wounds, the edges were frequently painted with iodine. In quite a proportion of lodged bullets infection occurred in the tract of the wound; this was especially noticed in those patients who had been carried long distances in rough, shaky vehicles.

In perforating abdominal wounds the tendency was strongly toward conservatism. If the patient reached the base hospital alive his condition was likely to be either hopeless or else quite favorable and not calling for operation. Very few laparotomies were performed in the Mukden or Harbin hospitals. The Shuvalov Hospital, at Harbin, appears to have been an exception. Out of 200 wounds treated, 15 were cases of abdominal wounds; 10 laparotomies were performed with at least 3 deaths. I could not obtain particulars in these cases, but the presumption is that these patients, having survived at least a week of rough riding in freight cars, would have had excellent chances of recovery without surgical interference.

Several cases of urinary fistula from bullet wounds were healing without other treatment than free incisions and drainage. The same beneficent results was observed in a case of urino-stercoral fistula caused by a bullet passing through bladder and intestine and coming out near the anus.

Laminectomy, for gunshot wounds involving vertebrae, was done by several surgeons with very able results. Professor Butz performed the operation six times—2 cases, brought in in a desperate condition, died, 2 have recovered, and 2 remain in the same condition.

A very interesting and instructive question is that of the mortality in the Mukden base hospitals. Professor Butz, on February 21, claimed that of the 6,000 cases admitted in his hospital since the beginning of hostilities the mortality had not exceeded 1 per cent, and that until the winter set in and infected wounds became frequent, it did not exceed one-half per cent. It is hoped that accurate statistics, including all base hospitals, will be published, but, meanwhile, there can hardly be a doubt that hospital mortality in warfare has fallen to a minimum almost beyond the hope of the most sanguine believer in the wonderful efficacy of modern surgical treatment.

DISINFECTION DETACHMENTS.

On February 24, 1905, there were 10 of these detachments with the Russian army, some with field, others with base hospitals, each having a personnel of 1 surgeon, 3 feldshers, 6 nurses, and 4 drivers. The material comprises 4 vehicles, 1 steam chest, and 3 formaldehyde generators, namely, 2 Esculap (Berlin) for paraform pastilles and vapor of water combined, and 1 Tsarevitch, the ordinary formalin type. The steam chest, devised by Rapchesky, of St. Petersburg, is a heavy, clumsy vertical cylinder of difficult transportation, with fire box below and space above for hanging infected objects.

There seemed to be but little work for these detachments, and much of the material at the above date had never been used.

The Red Cross has also a few very complete disinfection and laundry plants in specially constructed railway cars, which are taken and used wherever needed.

BACTERIOLOGICAL STATIONS.

During the winter (1904–5) there were three of these, one at Harbin, one in Mukden, and one near Huanshan. The personnel consisted of 2 surgeons, 3 feldshers, 6 nurses, and 5 drivers. The material was carried in 5 carts. All necessary appliances, including microscope, are contained in a portable box 2 by 2½ feet (system of Doctor Munche, of Berlin). There were also medicines and dressings on hand for the treatment of patients while under observation. From what I could see and hear these stations have not been very active; the one I visited at Huanshan had no record of any examination made.

HOSPITAL TRAINS AND EVACUATION.

For the transport of troops, as well as for the evacuation of the sick and wounded, freight cars are mostly used. The Russian freight car is about 20 feet long and a few inches wider than the American car. It opens by a large sliding door and is lighted by two small dormer windows on each side. On the outside is the painted notice that it accommodates 40 men or 8 horses. In reality it seldom carries more than 34 men with their bundles and boxes, and even then with considerable crowding. The interior fittings consist chiefly of two superposed platforms built around, against one side and both ends, wide enough for men to lie down upon, and a small stove. The lower platform is high enough to permit loaded stretchers to be placed under it (resting upon the floor) when the car is used for the wounded, but the space was very rarely utilized for that purpose. There is no bedding provided for the traveling soldier, nor any toilet conveniences; for the calls of nature he must avail himself of the long and frequent stops at and between stations.

In Russia and Siberia one travels slowly but comfortably. The passenger cars open at the ends and connect, as in the American system. There are four classes of trains for passengers, all but the fourth class easily convertible into hospital trains. In the first class each closed compartment accommodates two passengers, and there is a toilet room between each two compartments. In the second and third classes the car is divided into open compartments by cross partitions extending to about 3 feet of the other side, leaving space for a narrow passageway and set of lengthwise seats. The last compartment contains toilet room and heating plant. The third-class cars are those almost always utilized to transport the seriously wounded. They are divided into eight compartments, exclusive of toilet room. Each compartment has three superposed seats or couches on each side, but in hospital cars the top one is used only for baggage and clothing, so that 32 patients are readily accommodated, the seats alongside the passageway being replaced by shelving and cupboards. In second-class cars there are fewer compartments and more space. The heating is by steam and very satisfactory; the ventilation is also very good. Of the toilet room I can not speak in praise; it was always untidy, seldom clean, and frequently out of order. The water-closet (hardly every flushed) is an open one, the excreta falling upon the track, and therefore, in case of infectious disease, becoming a source of danger. The seats in third-class cars when used for couches have a band of strong linen stretched in front and secured to studs above so as to prevent the occupants from rolling out.

Hospital trains are of four types:

(1) White trains or trains de luxe (painted white), provided by members of the imperial family and wealthy aristocracy—some eight or ten.

(2) Regular military trains, consisting, in part, of third-class cars as described above—ten in all.

(3) Red Cross trains, the same as No. 4, but with a few added comforts—about a dozen.

(4) Freight trains, with cars fitted out with platforms as described above—number indefinite.

All hospital trains, military and Red Cross, are in command of line officers, generally of the rank of captain, having complete authority over the medical staff and personnel.

The white trains are nearly all that the most exacting humanitarian could expect in the way of safe and comfortable transport judging from the two I visited, those of the Grand Duchess Maria Pavlona and of Princess Yosupovoi. The only critcism one could offer is the want of special facilities for the introduction and removal of patients. Their capacity was about 200 beds, outside of staff and personnel. The appointments were such as met the approval of all surgeons. The operating room, occupying an entire car, had all the conveniences one finds in any good hospital. The pharmacy and dressing room occupied another car. The grave cases were laid on wire-bottom beds resting on the floor, six on each side, the beds being easily moved by jointed handles which when not needed were bent down out of the way.

The less serious cases were disposed on Kruger beds. Several of these trains were provided with disinfection plant and steam laundry, adjuncts which were taken and left wherever most needed. One of the Red Cross trains carries a complete ice plant, producing some 4,000 pounds of sterilized ice daily.

I traveled from Harbin to Tiehling in a regular military hospital train (Siberian military sanitary train No. 16), and its description will closely apply to all others of that class. It consisted of 28 cars, 20 for patients, as follows: Four for serious cases, each accommodating 18 men on Kruger beds; 6 for light cases, being adapted third-class cars, each for 32 men; 10 ordinary freight cars, each for 20 men. Of the 8 remaining cars, 1 was pharmacy, operating room, and bath (therefore divided into three sections), 1 for officers, 1 for female nurses and linen room, 1 for hospital corps personnel, 1 for kitchen and supplies, 2 for baggage, and 1 for ice (in winter used for other purposes). The personnel consisted of 1 line officer (captain) in command, 3 surgeons (the senior with assimilated rank of colonel), 1 quartermaster and commissary (official), 5 feldshers, 9 female nurses, and 46 male attendants (9 of whom were furnished by the railroad company). As the train was returning empty to the seat of war I did not see its personnel at work, but I judge that any weak point would be found among the male attendants, men with no aptitude and but little training for their duties. The car in which they were crowded was very untidy and ill smelling.

The train normally accommodates 464 patients, but under stress of necessity can be crowded to 600. It first arrived at Harbin in August, 1904, and up to February 5, 1905, had transported 4,600 sick and wounded to Irkutsk, making 10 trips from Liaoyang and Mukden and one from Nikolsk, or an average of 418 patients for each trip.

The Kruger system of bed suspension, the usual one in hospital trains for serious cases, consists of a row of uprights on each side of the car, two for each bed, each upright giving off two superposed horizontal arms projecting inward and bearing springs; upon these springs the beds are laid, nine on each side. or eighteen in all. The springs under the beds soften vertical motion, while lateral motion is deadened by an inward and an outward spring set into the upper part of each upright and playing within a longitudinal bar. A great advantage of this system is the facility with which patients are placed upon and removed from beds and their needs attended to.

The kitchen on this train was well appointed, containing a large modern range and three capacious boilers heated by steam from a steam generator in a contiguous room.

The freight cars were lined with felt or cotton batting, sometimes boarded over. A few of them had also a double door—that is, a smaller door inside the large sliding one, so as to save heat.

The freight cars used in any class of train for the transport of the sick and wounded have but little to recommend them besides their simplicity and inexpensiveness. They seem to be well heated in winter, but the ventilation is always imperfect and the air often very foul. The patients lie on hard board platforms with or without the interposition of blankets. Only around the stove, near the door, can one stand up. The only light is what comes through the two very small dormer windows above the upper platform on each side. A bucket is provided for excreta, and, it is said, was frequently omitted in the early days. Most of the hospital trains have now a kitchen car, from which the patients are fed. Great difficulty was formerly experienced in feeding patients at étapes along the road, and the present system has proved much more satisfactory.

Besides hospital trains I should also mention the flotilla of hospital boats built by the Government and partly by the Red Cross for the evacuation of the sick and wounded from Harbin, by the Sungari River to the Amur, to be distributed along that mighty stream to Khabaroff, Blagovestchensk, and Chita. These boats are flat, two-decked barges, with a capacity of about 130 beds, towed by tugs. The scheme was a failure. Owing to the variable stage of water in the Sungari in summer, from flood to complete dryness, the travel up and down the river is very uncertain, many days being spent on sand banks. In winter the boats, bound up in ice, become too cold to be habitable. They have been abandoned.

The evacuation of the sick and wounded has had enormous difficulties to contend against, owing to the multitude of patients to be transported from a few hundred to a thousand or more miles, and the existence of only one line of evacuation—namely, a single-track railway. The perseverance and energy with which this work of evacuation has been prosecuted and the many excellent results obtained under such adverse conditions are certainly worthy of admiration.

The Russians have always been very diligent in securing their wounded and helping them to places of safety, often, as stated before, at the risk of depleting the line of combatants, so that comparatively few have fallen into the hands of the enemy. This solicitude for the removal of their wounded, the gravest as well as the lightest cases, is undoubtedly a natural and humane trait, but it may well be asked whether it is always for the benefit of the patient. At least 1 out of each 10 or 12 wounded is in such critical condition that transportation, however short and gentle, is exceedingly dangerous and, in Russian vehicles, almost necessarily fatal. In every column of carts arriving at Mukden were nearly always corpses of men who had died on the way. Therefore, when dealing with a civilized enemy, a signatory to the Geneva Convention, it would seem reasonable and clearly in the interest of the wounded to leave such critical cases at the dressing stations, to be moved later when their condition justifies it or to fall into the hands of the enemy, if needs must. The chances are that the victorious enemy, whose field hospitals are advancing, will not have to subject them to much handling.

An interesting fact is that in all their hurried retreats the Russians always succeeded in completely evacuating their hospitals and getting away with their sick and wounded. Mukden might be considered an exception, but it was all the better for the wounded. When the situation there became desperate, on the 8th of March, at least 5,000 men were evacuated in twenty-four hours, the last train leaving on the morning of the 10th, just as the Japanese bullets were beginning to render the railway station untenable. Only 300 or 400 of the gravest, untransportable cases remained behind, and it is probable enough that had another train been available these, too, would have been carried off. One may readily imagine the conditions under which such hurried evacuation is likely to be made. Hospital trains were too few and badly prepared for such emergency. For instance, the chief surgeon of one of the largest hospitals needed at least 20 cars to accommodate his patients, but 10 is all he could secure, and they were crowded accordingly. The same precipitation and crowding occurred upon the evacuation of Liaoyang. I have been told by a witness that some 2,000 wounded were there packed on a train of some 50 cars without convenience of any kind. There was no arrangement in those days to feed the patients along the line, and during the tedious journey of several days to Harbin many must have severely suffered from hunger and thirst, and not a few died of exhaustion.

A curious incident at Mukden shows that even in war with a civilized enemy it is always well for the personnel of a base hospital to be ready to assume the duties of combatants. In the very few hours which lapsed between the retreat of the Russians and the advent of the Japanese, bands of Chinese looters proceeded to set fire to the abandoned hospital buildings, and it was only by the arming of the personnel and its determined show of resistance that the two hospitals, containing the remaining wounded, were saved from the flames.

The policy of the evacuation committee seemed to be to transport the wounded as far as possible from the scene of operations, leaving the gravest cases in the nearest base hospitals, so that Mukden and Tiehling during the first year of the war always had a high percentage of these cases. In June, 1904, the wounds necessitating admission at Tiehling affected the different parts of the body as follows: Abdomen, 20 per cent; cranium, 20 per cent; vertebral column, 15 per cent; chest, 8 per cent; extremities, 12 per cent; multiple wounds, 5 per cent. But as hospital trains become more numerous and better equipped, the badly wounded were often carried as far as Harbin or even much farther before being admitted to hospital; thus, as already noted, at the hospital Shuvalov, at Harbin, out of 200 patients treated up to January 12, 1905, 15 were cases of perforating wounds of the abdomen. All hospital trains coming from the south stopped at the distribution hospital in Mukden, near the railway station, and all critical cases, or as many as the hospitals could accommodate, were to be left there. But the segregation of cases had necessarily to be cursorily done, and many went that should have been kept, and vice versa, while not a few were assigned to freight cars who ought to have traveled in bed.

The distance from Mukden to Harbin is only 334 miles, but the rate of speed is so slow and the stops so frequent on that overtaxed line that it is not unusual to spend four or five days, or more, on the journey. Then if the patient's destination is Chita or Irkutsk, he has another week or two of exhausting traveling ahead of him. Furthermore, when he arrives at his destination he may have to wait in his car until a place is found for him in one of the hospitals. Thus a number of trains arriving at Harbin after the battle of the Sha River had to wait three or four days before they could be unloaded, no preparation meanwhile having been made for the feeding of the patients.

The medical department, profiting by its experience, has made earnest efforts to remedy its shortcomings and deficiencies so far as lies in its power, so that I believe it will be more difficult for the disinterested observer hereafter to find subjects to criticise.

PROJECTILES AND GUNSHOT WOUNDS.

The shells of the Japanese field artillery are of two kinds—the ordinary shrapnel shell and the shimose shell. The shrapnel shells were much more numerous and did most of the execution. The shimose shell explodes with great noise in striking the earth, excavating a little crater and giving off a small cloud of thick brown smoke. Except when exploding within a short distance, it does but little mischief, for it breaks into a multitude of fragments, most of them minute and without much power of penetration. Thus it is not infrequent to find a patient whose skin is peppered with numerous tiny bits of metal, none of which penetrates the deep fascia. I was told of a patient who survived the removal of 300 fragments from his skin and muscles.

The Japanese bullet is hardly ever deformed in the human body and its smooth, clean jacket rarely broken or detached from the core. It is certainly, on all grounds, one of the most humane bullets ever used in warfare. It has been known to pass through all the structures of the body, including heart and brain, without fatal effect. According to Dr. Zoge von Manteuffel, there have been officers who after being shot through one leg, or through the chest or neck, were not disabled and continued at their posts during the battle. He has seen five cases of wounds of the heart recover without treatment. I was assured by Doctor Butz, chief surgeon of one of the large Red Cross hospitals at Mukden, that in at least three cases under his observation, which entirely recovered, the bullet, judging from the location of the holes of entrance and exit, must have passed through some part of the heart. Doctor Zeldovitch mentions soldiers who, after being shot through the lungs, walked 12 to 18 miles almost immediately afterwards.

As in previous wars, it has been noted that men not mortally wounded on the battlefield have excellent chances of rapid recovery. The wounded who reach a base hospital alive are almost sure of getting well, or at least of saving their lives, the mortality in such hospital being very small. It is the opinion of Russian surgeons that one-third of the wounded are returned to duty within a month or six weeks. This is especially true of wounds received in summer, when the clothing is thin, scant, and comparatively unsoiled, therefore when infection of the wound is less likely. The chief surgeon of a field hospital reported that among the 310 wounded returned to duty within six weeks after the battle of the Yalu there were 8 cases of perforated chest and 3 of perforated abdomen.

Severe hemorrhage is hardly ever seen during transportation or after admission to hospital. The patient rapidly bleeds to death on the field, or else the hemorrhage is easily controlled. That serious injuries to blood vessels from gunshot wounds may occur without fatal result is not infrequently demonstrated. Thus I was shown in the hospital Shuvalov (by Professor Sianojentzky) a piece of femoral artery perforated (not severed) by a Japanese bullet, and fragments of a tibial artery which had been completely cut, both patients getting well.

The following statistics of work done at the battle of the Yalu, by field hospital No. 15, may give an idea of the relative proportion in which the parts of the body are hit, and some of the results:

Out of 1,129 wounded the parts struck were as follows:

Parts struck.	Number.	Per cent.
Lower extremities	416	37
Upper extremities	309	27
Chest	221	19
Abdomen	107	9
Head and neck	76	6

Bone injuries were found very benign, splintering or comminution existing only in 9 cases. In wounds of the cranium, only 3 were complicated with extensive fracture. In wounds of the joints of the lower extremities, recovery was very slow. In perforating wounds of the chest (37), hemoptysis was always noticed, but subcutaneous emphysema was quite rare.

Of perforating wounds of the abdominal cavity, 25 cases came under treatment. No operation was possible or attempted. Within twelve days 7 died, a mortality of 28 per cent. Some of these cases had traveled 40 miles in rough carts; others came on horseback; only a few were brought on stretchers; 8 arrived with peritonitis. That only 7 died under such conditions is, indeed, most remarkable.

Doctor Kholine, of Moscow, noted that in 39 cases of perforating wounds of the thorax the bullet lodged in only 1 case. In 21 cases there was hemoptysis lasting from one to six days, while subcutaneous emphysema was only noticed in 3 cases. He also reports that out of 27 cases of abdominal wounds only 1 death occurred. Doctor von Manteuffel thinks that peritonitis in such cases is mostly the result of rough transportation, and this opinion is shared, I believe, by most Russian surgeons.

The innocuousness of abdominal wounds inflicted by the Japanese bullet is often wonderful. In Harbin I saw a patient who had been shot simultaneously through the abdomen (antero-posteriorly) and the fleshy part of the thigh. When brought to the hospital several days later the thigh wound was infected and painful, but the abdominal wound had entirely closed up, and the patient hardly remembered that he had been shot in that region.

Wounds of the head and spine continue to be very dangerous. Wounds of the neck often show remarkable instances of the narrow escape of blood vessels and spinal cord, the bullet separating tissues rather than cutting them. To note only two cases I saw in Mukden, both convalescing: In one, the bullet entered at the point of the chin and came out close to the spine on the right side; in the other (Prince Murat, volunteer French officer) the bullet perforated the neck from side to side, coming out close to the internal carotid, or between it and the jugular vein.

There has been less stress laid on the so-called explosive effects of the bullet in this war than in previous wars. It may be partly because most of the battles were fought at middle or long ranges. I doubt whether I saw more than one or two cases in the Mukden hospitals which could be attributed to explosive action. Doctor von Manteuffel, in his treatment of numerous wounded after Liaoyang, did not find a single instance of explosive effects, although some of the wounds had been received within a range of 100 yards. However, he is not prepared to state that such effects do not take place in the brain, as all the wounds of the cranium he observed had been received at distances of at least 900 yards.

Cases of multiple wounds are common, patients being hit by several bullets simultaneously or within a short time, often in the same exposed part. One patient is reported as having received 8 separate wounds, 6 of which were in the left lower extremity, and to have survived. I saw, in one of the Mukden hospitals, a patient whose lungs had been perforated by three separate bullets and his arm smashed by a piece of shell. General Keller, when killed, was struck by 5 fragments of a bursting shell and 31 shrapnel bullets in different parts of the body.

WOUND INFECTION.

Nothing in this war has disproved the general belief that the modern bullet is practically aseptic. That the infection of wounds depends chiefly upon the skin and clothing of the soldier is well shown by the striking difference in the proportion of infected cases between summer and winter. Thus in the Mukden hospitals hardly 10 per cent of the wounds were infected in summer, while in winter hardly 10 per cent escaped infection, despite the primary dressing applied to most of them. The cause is evidently the difference in the condition of the skin and clothing, a difference much more accentuated in Russian than in Japanese troops. In summer men are more inclined and have better opportunities to bathe, the clothing is thinner, mostly of cotton, and the underwear more frequently changed. In winter the clothing is not only thicker, but some of it lined with fur, and in his warm, soiled garments, the soldier remains day and night for days and weeks. The natural result is contamination of the wound through dirt or particles of clothing, becoming the more marked according to the number of days the wound is left unattended. This infection, however, is not usually serious; except in cases greatly neglected it remains superficial and localized and seldom gives rise to marked constitutional symptoms.

Of the two causes of infection above mentioned—dirt and particles of clothing—it is quite probable that the first is much more common than the second. Doctor Kholine, in his examination of the clothing of many wounded men, found that the hole made by the bullet had almost always the appearance of having been cut as by the point of a knife, without the least loss of substance, so that the carrying of shreds into the wound must be a very rare occurrence.

Dirt, whether from the surrounding skin or soiled garments, is not only much more abundant in winter than in summer, but has generally more time to act upon the wound on account of the greater difficulties in transporting the wounded to the first-aid stations and field hospitals, and therefore, the longer time elapsing before they receive appropriate treatment. If it be true that the bullet is aseptic and that no particle of clothing enters the wound, then infection must take place principally after the receipt of the wound and, I believe, chiefly from contact of soiled clothing.

After pitched battles it always happens that many wounded can not receive prompt attention. However well organized the service may be, a certain number of patients will be brought to field hospitals without dressing two, three, or four days after the receipt of their injuries, at least it was so among the Russians, and I doubt very much whether such a misfortune could always be avoided on the Japanese side. But even in such cases, it is remarkable how quickly these old, neglected, infected wounds respond to antiseptic treatment and how easily blood poisoning can be averted. I saw a patient slowly recovering from suppurating wounds of both thighs, who had been left unattended for two weeks. Cases of gangrene must be rare. I only remember seeing one patient who had lost his leg from gangrene for want of timely treatment.

From the above remarks the conclusion might be drawn that were the soldier able to carry out all the prophylactic measures which military hygiene suggests, he should, on the eve of a battle, take a warm bath, with brush and soap, put on fresh thin linen, and don his cleanest and lightest uniform. He might carry these measures still further by taking a purgative and going into the fight with an empty stomach or a very light liquid meal. The soldier should be well fed, but on the day of battle his intestines should be vacuous. It is interesting to note that among Japanese officers there is an old custom of washing the body and putting on clean underclothing before a fight, arising from the commendable desire not to expose an unseemly corpse to the enemy.

DISEASE AND HYGIENE IN THE RUSSO-JAPANESE WAR.

The excellent health condition of the Russian and Japanese armies is a most gratifying feature of this war, one upon which the whole civilized world may well congratulate itself. It is evident that the lessons of the past have borne some fruit, and we may fairly hope that the wars of the future will not be attended with the frightful mortality from camp diseases which, up to this war, has always so greatly exceeded the mortality from wounds incurred in battle.

Complete statistics will doubtless be published on both sides upon the close of the war, but even now we have enough data to present a near estimate of the sanitary status of the Russian army during the past year.

According to General Trepoff's statistical report of July 28, 1904, the ratio of the sick, before the rainy season, up to June 13 was (officers excluded) 32.82 per 1,000 of strength. On July 26, after the rains had set in, the ratio had increased to 37.42; that is, less than the ratio of men generally excused from duty at most of our posts in time of peace. On that date the number of sick with contagious diseases was 1,117, including all cases of dysentery and diarrhea. There were only 34 cases of typhoid fever, 15 of typhus, and 9 of recurrent fever. The number of typhoid-fever cases, however, rapidly increased up to 951 on August 26.

Owing to the difficulty of preparing and transmitting reports in the field and the strong tendency of human nature to minimize whatever is to our disadvantage, it may be fairly assumed that the figures here given always more or less understate the reality.

The official report issued in December, 1904, gives the ratio of the sick per 1,000 of strength in the Manchurian armies for each month (excepting January and December) as follows:

February	26.22	July	39.19
March	19.78	August	29.28
April	11.98	September	31.51
May	15.71	October	23.21
June	28.69	November	19.98

These ratios were less than for troops in Russia during the same months.

On December 8, 1904, there remained in all hospitals and other sanitary establishments 819 sick officers and 17,384 sick soldiers, being at the rate of between 3 and 4 per cent. On that date the capacity of all available hospitals in Manchuria and adjoining zones was at least 30,000 beds.

On February 8, 1905, there remained in hospitals 873 officers and 17,892 soldiers.

Medical Director Bistroff, in Harbin, on January 24, before the wounded from Chentanpu had begun to arrive, informed me that from the beginning of the war 118,000 sick and wounded had passed through Harbin, about an even number of each, rather more wounded than sick. But this does not entirely agree with the annual report of General Trepoff, which I will now consider.

The official report of General Trepoff, commanding-general of the medical department in the field, for the period from the beginning of the war to the end of the year 1904 (January 14, Gregorian calendar), furnishes us valuable information. According to this report the total number of sick and wounded evacuated to Harbin and to places east and west of it (Nonni, Chita, Irkutsk, Nikolsk, Khabarofak, etc.) was 130,439 officers and men, namely:

	Officers.	Men.	Total.
Wounded	1,710	53,890	55,600
Sick	2,308	72,531	74,839
Total	4,018	126,421	130,439

Who were disposed of as follows:

	Wounded.			Sick.			Grand total.
	Officers.	Men.	Total.	Officers.	Men.	Total.	
Dead	45	1,232	1,277	62	2,668	2,730	4,007
Invalided			6,474			11,248	17,722
Returned to Russia	559	4,121	4,880	670	4,079	4,749	9,629
Remaining in hospital	152	4,953	5,105	634	15,815	16,449	21,554
Returned to duty			38,064			39,663	77,727
Total			55,600			74,839	130,439

If we assume (as we may) that one-third of the sick and wounded remaining in hospital ultimately recovered, then the numbers returned to duty would be 39,765 wounded (nearly three-fourths of the total) and 45,146 sick (nearly two-thirds of the total).

To obtain the total number of sick and wounded at the close of the year 1904 it would be necessary to add to the number evacuated to or beyond Harbin those remaining in all the hospitals south of Harbin. Of the number of the latter I have no data; I do not believe it was very great, since the policy of the medical department was to ship patients as soon and as far as possible, so as to keep the field and nearest base hospitals always available. We may set it down as between 5,000 and 10,000.

The percentage of deaths among the sick and wounded after their evacuation from the front, namely, 3.64 for the sick and 2.29 for the wounded, is remarkably small when the hardships and sufferings inseparable from the methods of transportation are considered.

The number of sick is seen to be greater than that of the wounded in the proportion of 1.35 to 1. If we add the killed to the wounded the total of sick would still be somewhat greater than the total of casualties, as 1.12 to 1.

During the year 1904 the total number of Russians killed in action or who died from wounds can not have been less than 20,000; during the same period the number of deaths from disease, according to the above report, was only 2,730, a ration of 7 to 1.

During the year 1905, up to the close of hostilities, about May 1, two important battles were fought and various skirmishes, with a resulting total of wounded that can not be less, but is probably more, than 100,000. If during this period of four months we assume the same ratio of sickness that prevailed in 1904 (and there is good reason to believe that it was rather less than more), the number of sick would be under 40,000. Adding together the data of both years we find that for the whole war, or, more strictly speaking, up to May 1, the total wounded is to the total sick as 155,000 to 115,000, or in the proportion of 4 to 3.

As to the comparative numbers of deaths from disease and wounds we find that they were approximately 6,000 and 47,000, respectively, or in the proportion of about 1 to 8, a result far transcending the most sanguine expectations of military hygienists.

During May and thereafter newspapers contained rumors of serious epidemics of dysentery or even cholera at Harbin and vicinity, but they have not been confirmed and were evidently due to grossly exaggerated accounts of the usual increase of diarrheal complaints which might be expected during the rainy season.

The number of cases of epidemic diseases for the first week of December, 1904, for all troops east of Lake Baikal (about 570,000 men), was as follows:

	Remaining Dec. 1.	During the week.		Remaining Dec. 8.
		Admissions.	Discharges.	
Dysentery	346	57	118	285
Typhoid fever	1,981	215	329	1,867
Typhus	10	4	6	8
Recurrent fever	13	3	1	15
Undetermined fevers	13	3	12	4
Grippe	287	141	186	242
Gastro-enteritis	4	1	....	5
Malarial fevers	110	28	34	104
Anthrax (Siberian pest)	64	28	32	60
Erysipelas	51	15	19	47
Scurvy	2	1	2	1
Smallpox	....	2	....	2
Tetanus	....	....	....	....
Unclassified	53	11	52	12
Diarrhea	410	159	216	353
Total	3,344	668	1,007	3,005

The status of epidemic diseases for the first week of February, 1905, was as follows:

	Remaining Feb. 1.	During the week.		Remaining Feb. 8.
		Admissions.	Discharges.	
Dysentery	120	9	8	121
Typhoid fever	389	45	9	425
Typhus	24	9	15	18
Recurrent fevers	2	1	....	3
Undetermined fevers	1	2	....	3
Grippe	206	173	138	241
Gastro-enteritis	3	5	3	5
Malarial fevers	59	43	37	65
Anthrax (Siberian pest)	34	9	16	27
Erysipelas	43	15	13	45
Scurvy	11	9	11	9
Smallpox	10	6	1	15
Tetanus	3	9	4	8
Measles	4	2	4	2
Diarrhea	245	134	86	293
Total	1,154	471	345	1,280

If we take typhoid fever by itself, we find that during the month of November, 1904, the numbers reported in all military hospitals east of Lake Baikal were as follows:

Remaining on November 1	1,962	
Admitted during the month	1,262	
		3,224
Cured	297	
Convalescing	1,558	
Dead	204	
Remaining on November 30	1,165	
		3,224

To make the number remaining on November 30 agree with that remaining December 1 (tabular statement of p. 78) it is necessary to suppose that a large proportion of the convalescents should be added to it.

If in the above statement we add the convalescents to those marked remaining on November 30, we have a total of 2,723, which is the highest number reported at any time, giving a ratio of about 4.75 per 1,000 of strength. It is very doubtful whether this ratio ever exceeded 5 per 1,000 (up to May 1, 1905). We may compare it with the ratio of 192 per 1,000, which prevailed in the United States camps in 1898.

According to the above data the rate of deaths was about 6.5 per cent. While visiting the Harbin hospitals in January I ascertained that the mortality then and there was about 10 per cent, rather more than less, a number of patients having doubtless died from the result of the long railroad journey.

A certain proportion of cases was characterized by a peculiar eruption, consisting of red, slightly papular spots not disappearing on pressure, almost petechial in character, as if there was a slight admixture of typhus infection. Such cases were always serious.

Typhoid fever is not rare among the Russian civil population of Manchuria, but has never prevailed in epidemic form. In Harbin it begins in July or August and lasts until November or December. During the year 1904 there were about 250 cases treated in the civil hospital of that town.

Outbreaks of typhus might have been reasonably expected in winter, considering the crowded condition and bad ventilation of the dugouts. A few cases were always present in the Mukden hospitals, the original contagion having probably been brought from Russia. I saw at least half a dozen. They were in a ward by themselves, but without any special measures of isolation. Yet this disease never spread beyond the sporadic form.

Dysentery is not rare in Harbin among the civil population from May to August—that is, during the rainy season—under the amœbic and bacillar (Shiga) forms. Among soldiers it has never been epidemic. In fact, true dysentery is uncommon, most cases so called being dysenteric diarrhea, from which patients recover in a few days.

Port Arthur during the siege would seem to have combined the most favorable conditions for the spread of epidemic diseases, but after its surrender and before many patients had been removed, toward the end of February, there were only 3 cases of typhoid fever and 48 of dysentery, scurvy (1,997 cases) being by far the most prevalent disease.

Malarial fever, speaking broadly, does not exist in Manchuria, the few cases on record having probably originated in Russia and Siberia.

Venereal diseases are not mentioned in the official lists, but it is well known that they were widespread and far exceeded all other classes of diseases. They formed the subject of a general order issued by General Kuropatkin mostly aimed at the officers, who suffered from them at least as much as the men. A Russian surgeon in charge of a sanitary train told me that on his last trip, out of 250 sick about 100 were venereal, and that one of his colleagues had informed him that on his train, out of 400 sick about 125 were venereal. These cases were transferred to distant hospitals west of Harbin, at least two weeks' journey from Mukden. It is not understood why they should have been so far removed from the scene of operations, unless easily replaced by other equally good or better soldiers. Except in Harbin, practically a Russian town, the regulation of prostitution was difficult and seldom effective, nor, so far as I could find out, were the men subjected to any special examination or restriction.

Smallpox was entirely absent among the troops in the field, a condition reflecting great credit upon the medical department and testifying to the care with which all soldiers are vaccinated or revaccinated before entering Manchuria and whenever exposed to infection. Likewise absent, or nearly so, were the other specific fevers—scarlatina and rubeola.

An interesting infectious winter disease in the Russian army, imported from Siberia, where it is endemic, but probably never before seen to the same extent in any campaign, is anthrax, the "Siberian pest" of the Russians, evidently contracted from infected garments, chiefly the fur cap and sheepskin coat. It manifests itself by a large pustule, mostly on the neck or face, and moderate febrile movement. During January, 1 or 2 cases were daily admitted at Mukden into the hospital specially set apart for it. The type was quite mild, the mortality being only 1 to 2 per cent. The treatment consisted in the injection of a 5 per cent solution of carbolic acid into the base of the pustule and painting the surrounding skin with tincture of iodine.

Of beriberi, the scourge of the Japanese army, there is no trace among Russian troops. Whether the Japanese army, exclusive of beriberi, has a smaller rate of disease than the Russian army I am unable to say, but there is hardly room for doubt that, including beriberi, its rate is higher.

In Manchuria, among Russian troops, one might have fairly expected certain diseases to break out in epidemic form, such as typhoid fever, typhus, dysentery, cholera, smallpox, and scurvy. The experience of previous wars made us apprehend that such would be the case as the result of the enormous aggregations of men under very trying hygienic conditions. But not only have epidemics been absent, but the usual camp diseases have not been prevalent, so that the health of the Russian army in the field has not been any worse, and during certain months was better, than at home in peaceful time.

Very plausible reasons have been adduced for this happy state of things. It is certain that serious efforts were made by those in high authority to place the soldier in as good sanitary condition as possible. No money was spared to secure comfortable quarters, wholesome food, and a sufficiency of well-equipped hospitals. The critical foreign observer can easily detect shortcomings and, here and there, lack of organization and management, but it is doubtful whether any other civilized nation would have been able to exhibit better results.

The interest of commanding generals in questions of sanitation is well shown, for instance, in the following order, issued by General Nadarov, commander in chief of the Army of the Rear:

> HARBIN, *January 16, 1905.*
>
> I desire Lieutenant-General Kugel to perform the duties of commandant of the hospitals of the Army of the Rear and Colonel Bogdanov * * * to assume the duties of director of the chancellery (clerical bureau) of the medical department of this army. * *
>
> I beg Lieutenant-General Kugel to enjoin upon the directing personnel of all hospitals strict compliance with these two fundamental rules:
>
> (1) Hospital buildings should be kept even cleaner than my own quarters.
>
> (2) The hospital linen should be frequently washed and kept even cleaner than the linen I wear.
>
> The rest accordingly.
>
> In general, I desire that business on hand receive the chief attention while paper work should occupy a secondary place.
>
> NADAROV,
> *Lieutenant-General.*

We may question the practicability of the above two rules, and therefore the wisdom of enjoining their execution, but there can be no doubt that they were the expression of a genuine solicitude for the welfare of the sick and wounded. General Nadarov not only issued orders, but personally inspected hospitals to ascertain to what extent they were carried out, and some of the hospital surgeons complained that he also meddled with professional matters beyond his competency.

Concerning the hygiene of camps, it varied much, as must always be the case, according to the knowledge and experience of commanding officers and the extent to which they saw fit to carry out the recommendations of the medical officers. An excellent feature from the hygienic point of view was the scattering of troops, seldom more than one regiment (3,000 to 4,000 men) being encamped together. In fact, as part of each regiment was constantly on duty along the line of positions, it was unusual to have more than one or two battalions at the same time in each regimental camp. The extended and more or less scattered formation of troops in modern warfare certainly helps in preventing insanitary conditions and the spread of disease.

Nearly all the drinking water was obtained from wells 20 to 40 feet deep. In the cold, snowless Manchurian winter such wells can be kept entirely free from contamination, since the frozen ground does not permit any drainage of surface waters into them. They are greatly preferable, as source of water supply, to a stream flowing near or through many camps and surrounding villages and susceptible of infection at many points, although such a stream would also be much less liable to contamination in winter than in summer. This well water, as a very general rule, was remarkably good, somewhat rich in mineral substances, but tolerably free from organic matter.

I was assured that, in the first part of the war, including the Liaoyang campaign, the sanitation of camps was very much neglected; that, for instance, no latrines were dug, a place, perhaps, being simply set apart for defecation. If so, during the winter of 1904–5, the conditions had certainly much improved. The several regiments I visited at the front had the same system of privies. In some spot, as far as possible from kitchen and water supply, parallel narrow trenches were dug, a foot wide (or less) and 1 to 2 feet deep, over which the men generally squatted astride in defecating, the earth from the new trench being thrown over the trench already filled up. I saw no evidence that these latrines were not used by all the men. In winter, when the earth is hard frozen, digging is hard work, but becomes easier the deeper one goes, so that it might have been more advantageous to make the trenches 6 or more feet deep; but, on the other hand, this would have required greater width and the use of a pole, with supports, for the men to sit on, and economy of material had to be considered. It must also be admitted that, with shallow trenches, there is less danger of well contamination.

The regimental camps I saw were kept clean, most of their area being swept every day, and the garbage being either burned or buried. Sweeping in camps, especially in a dusty country, should, I think, only be done when and where necessary, and with judgment, a general daily sweeping of all grounds being productive of more harm than good. Each camp, if somewhat permanent, had a bath house for hot water and vapor bath, but such bath house was necessarily crudely equipped; it was too small and the supply of water and fuel too limited to enable many of the men to avail themselves of it.

Most of the food and drink of the Russian soldier are so prepared that they can not transmit infectious germs. All the ration, bread excepted, is thoroughly cooked in the company kitchen, and therefore sterilized as well as rendered perfectly digestible. The bread (rye brown bread), as already stated, is mildly laxative, so that constipation is unknown in the Russian army, the bowels always moving freely and abundantly, a matter of importance from the hygienic point of view. The Russian soldier's ordinary beverage is tea. a mild infusion of a grayish-black Chinese tea which can be drunk in large amounts without unpleasant effect. The Russian is not satisfied with hot-water tea; he always wants it made, as it should be, with boiling water, which is easily obtained from the company kitchen boiler. Most of the liquid ingested, therefore, is in a sterilized form, either as tea or soup.

It is also true that hospital accommodations are adequate, so that infectious diseases can be promptly segregated: no febrile case is kept in the regimental infirmary, a most important and efficient measure of prevention.

In spite of all this I can not help thinking that the absence of typhoid fever and dysentery, in an epidemic or very prevalent form, is not yet satisfactorily explained. The Russian soldier preferably drinks tea, but tea is not always within reach, and, on frequent occasions, in summer and fall, he quenches his thirst at any convenient well or stream, any order to the contrary notwithstanding; and, in that regard, follows the example of the Japanese soldier.

Flies have been accused of being the chief transmitters of typhoid infection. They breed numerously in Manchuria and in summer swarmed in the camps. Excreta are not lacking; in most instances even where trenches are used they are more or less exposed and accessible to the flies. Another conveyer of infection, dust, is also abundant. Manchuria is the land of dust, especially in the fall and winter, and no possible precaution in camps can prevent soldiers from ingesting it with their food and inhaling it with their breath. Means of propagation, then, are not wanting, and if the Russian as well as the Japanese soldier remains exempt it is, I believe, because there is in them a natural want of susceptibility to those diseases, the same insusceptibility that we observe in the Chinese and other native races of Asia and Africa. This comparative immunity may be explained in two ways: In the first place, we know that the Japanese as well as the Chinese utilize all fecal discharges in manuring gardens and fields, and it is quite possible that a large proportion of the population thus constantly exposed to the infection contract the disease in infancy or childhood, probably in a mild form. On the other hand, it is contended that diet plays the chief part in causing this immunity. Asiatics eat but little meat, and subsist mostly on vegetables, cereal and leguminous, whereas English-speaking and other people who suffer most consider meat an essential, often the most essential, part of their diet. Which of these causes is most effective, or whether both are operative, it is at present impossible to determine. I am myself inclined to attach great importance to the preventive action of a vegetable diet.

From this war it would seem that we might well draw the lesson in the physiological economy of nutrition that Professor Chittenden has drawn from his very remarkable experiments. Both Russian and Japanese, although fed upon rations which American and English soldiers would reject with scorn, are men of vigorous constitution, who for strenuous work and endurance of hardships can hardly be excelled in the civilized world.

The Japanese attribute their physical and mental strength to their plain, frugal diet, the free use of water (internally and externally), gymnastics, and temperate habits. A laborer will work a whole day on a dinner of tomatoes, cucumbers, and salad, but I hope it is seldom that he is obliged to do without his favorite bean soup or boiled rice. Tea is taken without milk and sugar. The national alcoholic beverage, sake, is hardly stronger than beer; it is drunk only by those who can afford it and always in great moderation. Smoking is indulged in with a diminutive pipe holding a few pinches of tobacco. The result of this régime is a race of small stature (as compared with Chinese and Koreans), prone to beriberi, but hardy and sturdy, and with wonderful mental power of expansion and assimilation.

THE RUSSIAN RED CROSS SOCIETY.

ORIGIN, DEVELOPMENT, AND HISTORY.

The origin of the Russian Red Cross Society may be traced back to the Crimean war, in 1854, when was founded. for the purpose of nursing sick and wounded soldiers, the "community" of the Exaltation of the Cross, consisting of so-called sisters of charity, 120 of whom, under the direction of the great surgeon Pirogoff, went to Sevastopol and labored there, it is claimed, a whole year before Florence Nightingale and her English nurses appeared. Their efficient work in the Crimea, where 10 of their number died from infectious diseases, proved the usefulness of female nurses in the field, and detachments of them from various "communities" have followed Russian troops in all subsequent wars.

In 1867 was officially organized "The Russian Society for the Assistance of Sick and Wounded Soldiers" which, in 1876. assumed the name of "Russian Red Cross Society."

Under the high patronage of the Empress Maria Alexandrovna the society soon extended its beneficial activities in all directions. Not only did it work strenuously relieving friend and foe in the wars in which Russia participated. but also effectively intervened in foreign wars whenever permitted by the belligerents.

In all Russian wars, including the most distant and adventurous military expeditions, it took a conspicuous part. In 1868 it sent material to Turkestan, in 1871 personnel and material to Siberia, as well as 2 surgeons, 4 nurses, and 76 boxes of material to Khiva. In 1877–1879, during the Turco-Russian war, it assumed enormous proportions, not only cooperating with but, seemingly, often taking the place of the medical department. From April, 1877, to December 31, 1878, the society spent 17,000,000 rubles ($8,500,000), exclusive of large quantities of material. Before this war was over it sent a sanitary detachment with the Akhal-Teke expedition, organizing its own horse and camel transport, and, across the endless Transcaspian desert, establishing etapes where food, clothing, and bedding were distributed. Its activity in that region was renewed in 1881 during the war against the Turkmenes-Tekes, in which it spent more than 600,000 rubles.

Russia remained at peace until 1900, when broke out the Chinese Boxer rebellion, necessitating the forwarding of large bodies of troops to Manchuria. The Red Cross quickly organized flying columns of relief, established field hospitals, provided a hospital ship, and opened lines of evacuation. It supplied during the war a personnel of 600 persons, including 51 surgeons, 41 aid-surgeons, 319 sisters of charity, 18 brothers of charity, 103 male nurses, 16 female nurses, 17 lady nurses, etc., opened 46 hospitals and stations with capacity of 1,957, and spent 1,400,000 rubles of the total amount of 1,780,000 spontaneously contributed by the people.

But, as mentioned before, it readily and always extended a helping hand to all countries at war to a degree never equaled nor approximated by any other nation.

In 1870–71, in the Franco-German war, it sent 30 surgeons, many nurses, and a large amount of material to both countries.

In 1873, during the civil war in Spain, it sent 10,000 francs to that country to be equally divided between the belligerents.

In 1876, during the wars between Montenegro and Turkey, and between Servia and Turkey, it sent numerous personnel and abundant material, spending in both wars about 700,000 rubles.

In 1886, in the war between Servia and Bulgaria, it again promptly intervened, sending a sanitary detachment and supplies to each belligerent.

In 1894, when broke out the Sino-Japanese war, it sent a field hospital to Japan with material for 25 beds.

In 1896 it assisted in two different wars. To the Spanish Red Cross it sent 5,000 francs to be used in Cuba, and when began the attack of Italy against Abyssinia offered a sanitary detachment to each side. Italy declined, but the other detachment proceeded to Abyssinia, reached its capital, and there for many months rendered signal services.

In 1897 it took an active part in the relief of the wounded in the Greco-Turkish war, later effectually assisting the ruined Thessalians by cash and three transports freighted with food and clothing.

In 1898, when began the Spanish-American war, it again, as on every previous occasion, offered its help to both belligerents. It was declined by the United States but accepted by Spain, and 40,000 francs sent to the Spanish Red Cross.

In 1899, during the Boer war, help was declined by England but accepted by the Boers. A sanitary detachment was sent to South Africa, where it treated hundreds of patients and spent 112,000 rubles.

The Russian Red Cross soon recognized the importance of giving special attention to the hygiene of the sick and wounded in the field. After his experience in the Franco-German war, Pirogoff declared that surgery and therapeutics in war were of secondary importance; that hygiene alone could prevent wound infection. Since then the society has always endeavored to teach its personnel the great principles of the prophylaxis of infectious diseases and believes that by opportune isolation and evacuation in several campaigns it has prevented epidemics and the loss of many lives.

So far we have only seen one aspect of the manifold activity of the Russian Red Cross. The society soon realized that to be really effective and to receive the popular sanction and support which was necessary to its complete success, it was not enough to have an organization intended for war, to be set to work only when troops were mobilized for the field, but that it was also absolutely needful to have a permanent establishment with special personnel, taking an active part in the relief, so far as it is able, of all evils which afflict humanity, beginning with the usual every-day diseases which fill up hospitals in normal times and extending a strong, helping hand in famines, epidemics, and all public calamities. In pursuance of this object the Red Cross has well-appointed hospitals and dispensaries in most cities where all indigent applicants are admitted. It also sends sanitary detachments, in charge of physicians, to various remote provinces where medical attendance is scarce to give free consultation and treatment to the destitute peasants. It has even provided relief detachments for the help of emigrants at various distributing points in Siberia.

Since the year 1872 the Red Cross has been the chief factor in the relief of epidemics (plague, cholera, diphtheria, scarlet fever, typhus, typhoid fever, and dysentery), conflagrations of towns and villages, hailstorms, wrecks at sea, railroad accidents, floods, earthquakes, and famines. The bad harvests occurring in several years between 1891 and 1900 produced widespread destitution in many provinces of Russia, with the usual sequels of typhus and scurvy. In collecting and distributing supplies and spending millions of rubles for its relief the Red Cross was the trusted agent of the Government and of the people.

To complete the description of the scope of the operations of the Red Cross, it is also necessary to state that it maintains 4 asylums for its aged or invalid "sisters," 8 for crippled soldiers, 1 for soldiers' widows, 4 for the children of invalid soldiers, and 2 sanitariums for children. Furthermore, it is a pension bureau. Any soldier with valid claim receives cash or artificial limb, is admitted to an asylum, sent to a watering station, or his case is presented to the proper department of the Government for consideration. As an instance of its initiative and solicitude in finding and relieving all needs, let us note that since hearing of the straitened circumstances of Mr. Henri Dunan, the promoter of the Geneva Convention, it awards him an annual pension of 1,000 rubles.

If the Russian Red Cross is capable of such excellent work, it is chiefly due to the quality of its personnel, and this consists chiefly of women—trained nurses or (so-called) sisters of charity. There are in Russia, in the polity of the Greek Orthodox Church, regular cloistered nuns, wearing the cylindric black hat, which is also the characteristic headgear of the popes. With these nuns we are not concerned. The sisters of charity under consideration are quite different. They belong to various lay orders or "communities" (St. George, St. Eugenie, Exaltation of the Cross, Alexander, Elizabeth, Iverskaia, etc.), founded at different times under the auspices of members of the high nobility, often of the imperial family. The spirit and discipline among the communities may vary slightly, but their aim and object are practically the same. Any woman of good character, unmarried or widow, between the ages of 20 and 40 may be admitted to a community. She does not renounce the world, takes no vows, and may at any time (upon previous notification) leave the sisterhood; but while in the community she must submit to the established discipline, devote herself to the care of the sick, and strictly perform her duties. She also pledges herself in case of war to respond to the first call of the Red Cross and proceed to the seat of military operations. The only distinctive part of their dress is a white kerchief over the head, hanging upon the shoulders, and gathered together under the chin.

Of these sisters there are two classes—the sisters properly called, forming the great majority of the communities, and the "aid physicians," or matrons. Both classes receive their instruction and training in the establishments of the Red Cross, the first for a period of from one and one-half to two years, while the matron follows a three-years' course and may be admitted to the practice of medicine.

The first community of sisters of charity (Holy Trinity) was founded in 1844 for the care of the sick in general. In 1854, during the Crimean war, as already noted, was founded the community of the Exaltation of the Cross, for the special purpose of helping the sick and wounded in war. The third was inaugurated in 1859, and was soon followed by many others. When the Society of the Red Cross was finally organized, in 1876, nearly all these communities merged into it and became subordinated to it, the few exceptions being of the older communities founded long before the Red Cross.

The society, thanks to the great interest which it aroused, was soon able, through the generous contributions of the public, to establish houses in every city of the Empire. In 1902 their number amounted to 89, and were found in Europe, Siberia, and Manchuria. The number of sisters of charity in the same year was 2,579, while the total number of women who had received more or less instruction in the communities, and available in case of war to nurse the sick and wounded, was estimated at 4,000.

The band of sisters which, under Pirogoff, did such noble work at Sebastopol in 1854 and 1855, may not have been the first women helping wounded soldiers, but they may doubtless claim the credit of belonging to the first order especially created for war. In the United States and other countries there is a serious doubt as to the desirability of admitting women to or near the battlefield, any farther than base hospitals. This doubt does not exist in Russia. The sister of charity follows the surgeon wherever he may lead, and makes herself indispensable in field hospitals. She does not hesitate to undertake long, hazardous journeys with sanitary detachments, to keep in touch with troops and attend to their wounded. In Russia it may be said that nursing, in all situations, is done by women. This is due in part to the intemperate habits and marked inaptitude of the men, but more to the noble and self-sacrificing spirit of the women.

To form an idea of the work of the communities, let us look at the figures reported by that of St. George, at St. Petersburg, although not the largest nor the best endowed. It was founded in 1870, and has gradually developed into a large, well-equipped, up-to-date institution, which, in 1900, treated 879 patients in its wards (including 108 surgical cases) and 226,000 in its dispensaries. Following the trail of war, sisters from this community were sent to Montenegro in 1875, Turkey in 1877, Servia and Bulgaria in 1885, Transvaal in 1899, and Manchuria in 1900.

The sisters of charity supply the nursing personnel of all military and other Government hospitals and of most municipal hospitals. Some are found in the poorest and most distant provincial infirmaries. They also nurse patients in private families. In all their duties (except in war time) they labor gratuitously, receiving food, clothing, and other necessities in kind. When on duty outside the community the compensation (20 to 40 rubles per month) is paid to the community.

In 1897 the Red Cross also instituted a course of instruction for male nurses, or brothers of charity, which bids fair to give good results. It is believed, however, that they will always play a secondary and unimportant part in the technical care of the sick and wounded in Russia.

That the services of the Red Cross are highly and gratefully appreciated by the people is shown by the generous contributions which have poured into its treasury, and which still constitute its chief resource. These voluntary donations of money and material have steadily and rapidly increased, so that the assets of the society (exclusive of real estate), which were 93,000 rubles in 1868, rose to 1,250,000 rubles in 1877, 4,018,000 in 1880, 6,833,000 in 1890, 11,920,000 in 1900, and 12,498,000 in 1901. It owns, besides, real estate worth 6,000,000 rubles. It is to be noted that of all sums donated, according to the statutes of the society, two-thirds are to be held as reserve capital for use in war time or in preparation for war. Any encroachment on this reserve made necessary by an emergency must be made good as soon as possible.

ORGANIZATION AND STATUTES.

The society is under the high patronage of Her Majesty the Empress Dowager, Maria Feodorovna. It is regularly incorporated under the laws of the Empire. It may appeal to all public authorities for help in increasing or extending its sphere of action and to attain its objects. It may acquire and transfer property. In all its transactions and contracts it is exempt from the usual internal-revenue stamp taxes. It may appeal to private charity through the ecclesiastical authorities and, with their assent, place trunks in churches, or solicit contributions in all other public places with the assent of the police.

The emblem of the society on its seal, its flag, and its brassard is the red cross of the Geneva Convention, and no one may use this emblem in the Empire, except when authorized by the central committee and only for the purposes of the society.

MEMBERSHIP.

Includes active and honorary members, as well as contributors and benefactors.

Honorary members and benefactors are elected as such by the general assembly and confirmed by Her Majesty. In a state or local branch they are elected by the general assembly of the branch and confirmed by the central committee.

An active member is anyone making annual payment of 10 rubles ($5) or a single payment of at least 200 rubles ($100) to the central committee, or anyone making a payment of 5 to 10 rubles or a single payment of at least 100 rubles to a local committee.

contributor is anyone making an annual payment of 3 rubles or one payment of at least 60 rubles to the central committee, or anyone making an annual payment of 1 to 3 rubles or a single payment of at least 25 rubles to a local committee.

ADMINISTRATION.

The executive power is vested in a central committee, state, and local committees.

Outside of Finland, European Russia is divided into 60 states or "governments," and each one may have a committee.

The central committee sits in St. Petersburg and has the supreme direction and control of all the affairs of the society. The state committees have their headquarters in the capitals of their respective states; their organization and regulations must be approved by the governors of the states. Local committees may be organized upon the recommendation of the state committee, with the approval of the governor of the state, and provided the number of applicants for membership is at least five.

The state and local committees elect thier own officers and send yearly a complete list of their members to the central committee.

All members of committees perform their duties gratuitously.

The central committee consists of 25 members elected by the general assembly. Its president is appointed by Her Majesty, patroness of the society, from two names submitted by the members. In the same manner the two vice-presidents are appointed from the four names submitted. Six members go out yearly, in order of seniority and are replaced by the general assembly. The outgoing members are eligible for reelection. The president and vice-presidents hold office for a term of two years. Any member of the central committee remaining absent from its meetings for eight months is considered as having resigned, unless his absence was on business connected with the service of the Government or of the society.

The central committee has a secretary, assistant secretaries, treasurer, auditor, and the necessary clerical personnel, are appointed by the president, but the treasurer must be confirmed by the committee. Their pay is determined by the committee.

The state committee consists of from 8 to 16 members. They select from among themselves a president (man or woman), vice-president, secretary, treasurer, and assistant treasurer, to serve for a term of two years. One-fourth of the members is renewed each year. The committee may appoint such clerical personnel as may be necessary and determine its pay.

The central committee, the soul of the society, initiates and directs all the operations of the society. One of its chief duties is to secure and maintain a sufficient sanitary personnel by founding communities of "sisters" and arranging for their technical instruction in their own establishments or outside local hospitals.

It may, first, execute all kinds of contracts in behalf of the society; second, sue in its name and defend its interests before the courts; third, enter into relations with all governmental and public institutions; fourth, confirm and sanction the regulations of sisters' communities, asylums, infirmaries, etc.

It meets once a month, or oftener if judged necessary by the president or whenever desired by six or more members. Its decisions are valid only when at least five members are present at the meeting. But for the amendment of statutes, questions of budget, real estate, and subsidies, at least seven members and two-thirds of the votes are necessary.

All communications involving financial transactions or pledging any of the resources of the society must be signed by the president, two members, and the secretary.

The central committee furnishes state and local committees with models of all printed forms, so as to secure as great uniformity as possible in the rendition of reports and accounts.

ACCOUNTABILITY.

The state and local committees must as soon as possible publish in the newspapers the list of all donations made to the society.

All moneys received must be converted into Government securities and deposited in the Bank of Russia or any of its branches.

At the end of each year all committees balance their receipts and expenditures and prepare their budget for the following year, so that the general assemblies may know the assets in hand and take the necessary measures to solicit and procure the amounts needed. They also prepare their annual report, a copy of which is sent to the central committee.

Of the total amount received during the year, with the single exception of the sums donated for special purposes, the state and local committees must remit 10 per cent to the central committee to meet the expenses of the society. The remaining 90 per cent, after deduction of the expenses of the committees, are divided into three parts, of which two are placed to the credit of the fund reserved for war, and the third to the credit of the fund used for the benefit of crippled soldiers and public charities.

GENERAL ASSEMBLY.

A " general assembly " is convened at the end of each year, or oftener if the central committee deems it necessary and whenever a petition to that effect is presented by at least 50 members.

It consists of all members that choose to attend, and is presided over by the president of the central committee or his substitute. To be legally constituted it must consist of at least 30 members, exclusive of the members of the central committee, who must be at least 5.

Its chief duties are, first, the examination of the annual report of the central committee; second, the auditing (by a committee of three members) of the accounts of the central committee; third, the study and solution of questions and measures proposed by the central and state committees; fourth, the amendments of statutes; fifth, the election of members of the central committee, honorary members and benefactors, etc.

Each state having a branch of the society also convenes a general assembly, which is legally constituted by the presence of at least one-half the members of the committee and a larger number of other members.

OPERATIONS OF THE SOCIETY IN WAR.

The chief function of the Red Cross Society in war is to assist the medical department of the army first in rear, and when necessary and possible also at the front.

It supplies military hospitals with female nurses and, in case of need, also with male attendants. It furnishes them when required with dressings, instruments, linen, clothing, articles of special diet, etc. It helps the evacuation of the wounded and, through the local branches, assists the sick and wounded soldiers brought home. It organizes supply depots and feeding etapes.

With the assent of the military authorities it may develop its own formations for active work at the front, operating dressing stations, flying columns, field hospitals, and means of evacuation (trains, boats, vehicles). In such case it receives a compensation according to the terms of a tariff prepared by the minister of war.

Upon declaration of war and the mobilization of the army the central committee puts itself in relation with the minister of war and determines the character and extent of its probable operations, its programme being submitted to the patroness of the society, the Empress Maria, for approval. The general assembly is convened to advise the members of the measures taken, ascertain the sentiment and desires of the society, and devise ways and means.

Upon the theater of hostilities the decisions of the central committee are carried out by, first, chief delegates, one for each army or each zone of operations; second, simple delegates, one to each state, municipality, or small group of organizations. They are all appointed by the central committee, with the approval of Her Majesty the Empress Maria, and possess full powers with their limits, the chief delegate being only responsible to the central committee and to the general officer in command of the medical department of the corps or army with which he is serving. One of their principal duties is to watch over and protect the Sisters, making the best disposition of them and, as much as possible, keeping them in groups of three or more together, each group under the direction of a superior.

The chief delegate selects and discharges his own officials, assistants, and other personnel. He is required to keep the strictest accountability of all sums and material placed at his disposal.

The simple delegate is under the direction of the chief delegate of the army or zone to which he belongs, unless otherwise determined by the central committee, and supervises all the branches or organizations of his state or placed in his charge.

The central committee may, if deemed necessary, send one of its own members as special delegate, with plenary powers to inspect and investigate the administration of chief delegates or of any part of the work of the society.

The relations of the Red Cross delegates with the military authorities are defined in the army regulations. Although under the command of a general officer so far as their movements and sphere of action are concerned, they are allowed almost complete autonomy in the administration of their hospitals and other organizations.

THE RUSSIAN RED CROSS SOCIETY IN THE RUSSO-JAPANESE WAR.

The magnificent work accomplished by the Russian Red Cross at home and abroad in all previous wars, as outlined above, had prepared us for the prodigious efforts it put forth during this war and the very important part it played in the relief of the sick and wounded on the battlefield, in hospitals, and along the lines of evacuation.

At the very beginning of hostilities the central committee elected an executive committee of seven members, to preside over which Her Majesty, patroness of the society, appointed Count Varonzof-Dashkof, later succeeded by Prince Obolenski. Upon this committee devolved the duty of organizing and directing all the operations of the Red Cross during the war. Likewise, all state and local committees elected from among their members smaller executive committees for the better transaction of business.

An earnest appeal was made to all organized charities, municipalities, associations, and individuals for contributions in money and kind. Wherever committees already existed the marshals of the nobility, presidents of zemstvos, mayors, and delegates from merchants' guilds were requested to join them, and where committees did not exist these representative functionaries were exhorted to organize them. Local committees extended their propagandism to all towns and villages, so that before long money and donations in kind began to flow abundantly from all directions into the coffers and warehouses of the society.

In order to prevent irregularities and possible embezzlements, the executive committee appointed a "commission of control" of ten members, and furthermore invited all State and local committees to send special delegates to the front to supervise the expenditure of their respective funds.

Manchuria and eastern Siberia, which were to be the field of active operations, were divided into five zones and each zone placed under the direction of a chief delegate, as follows:

(1) Zone of Irkutsk, under Senator P. Von Kaufmann.

(2) Zone of Chita and Upper Amur, under Prince Sherbatov.

(3) Zone of the Northeast, with headquarters at Vladivostok, under Prince Vasilchikov.

(4) Zone of actual hostilities, with headquarters at Mukden, under the Chamberlain Alexandrowsky, later succeeded by Mr. Gutchkov.

(5) Zone of Port Arthur, under Master-of-the-hounds Balashov.[a]

The plan of the society from the beginning included five special fields of activity:

(1) Establishment of supply depots.

(2) Evacuation of the sick and wounded, by rail and water.

(3) Assistance to the military medical service in personnel and material, supplementing everything needful not found on the supply tables of the war department.

(4) Relief to the sick and wounded by base hospitals in

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[a] It will be noticed that these chief delegates were selected on account of their social standing, high civil functions, and, presumably, their executive abilities, but that none had a medical training.

rear as well as by field hospitals and flying columns at the front.

(5) Organization of feeding stations.

The question of supply depots being very important, received early attention. The principal ones were at St. Petersburg, Moscow, Penza, Irkutsk, Chita, Harbin, and Nikolsk. Secondary ones were also established at Mukden, Liaoyang, Kabarofsk, etc. They received money and objects of all kinds. To Penza, on the main railway line to Siberia, were sent all small gifts to be collected and sorted for shipment when in sufficient quantity, large shipments, one car or more, being sent directly to Manchuria.

Of the several depots in St. Petersburg the largest and most important was the one organized in the Winter Palace by Her Majesty the Empress Alexandra, where as early as July, 1904, $650,000 had been received in cash and a vast amount of hospital material and clothing accumulated. There, under the personal supervision of Her Majesty, hundreds of ladies were busily engaged making garments and all kinds of hospital dressing material.[a] The gorgeous halls of the Kremlin, in Moscow, had likewise been converted into depots and workshops where sometimes 2,000 women, many of the highest aristocracy, worked gratuitously under the direction of the Grand Duchess Elizabeth.

At the end of the year 1904 it was estimated that the Red Cross, outside of the supplies carried by the many organizations already gone to the front, had shipped about 3,000 cars of material to Manchuria and eastern Siberia, each car with capacity of 20,000 to 25,000 pounds. There were, besides, more than 200 cars awaiting shipment. Every day one Red Cross car full of supplies left from St. Petersburg and one from Moscow, attached to passenger trains. With each car was an attendant who every day telegraphed his whereabouts to St. Petersburg, where this information was entered on the descriptive card of the car, a complete record being thus kept of each car.

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[a] The list of objects in kind sent to this depot would be a long one. It included underwear, foot gear, winter garments, thousands of yards of cloth, linen, flannel, cotton, field packages for officers and soldiers (containing toilet and other necessary articles), bandages, gauze and antiseptic material by the ton, surgical instruments, medicines, camp cots, wheeled litters, camp kitchens, bibles, writing paper, books and periodicals, tea, coffee, sugar, cocoa, wines, preserves, lemons, chocolate, condensed milk, tobacco, tobacco pouches, cigarettes, matches, pipes, candles, buttons, pins and needles, etc.

The Red Cross assumed a large part, perhaps the larger part, of the service of evacuation. Within two months after the beginning of hostilities it had equipped a hospital ship, the *Mongolia*, in Port Arthur, with capacity for 300 beds; she was never able to leave this harbor. Another ship, the *Orel*, was outfitted in Toulon (France) by the joint contributions of the Russian and French Red Cross societies and the Russian navy. It accompanied Admiral Rozhestvenski's ill-fated fleet and was captured by the Japanese, who kept it, on the plea that it had violated neutrality by conveying information to the Russian admiral.

For the evacuation of the sick and wounded by water during the summer and fall, from Harbin northward to the Amur, the Red Cross gave very material assistance in the organization of a flotilla of 17 two-decked barges and 7 tugs, with total capacity of 2,000 beds. As explained in the first part of my report, the scheme was a failure owing to the variable stage of water in the Sungari River, from flood to complete dryness, and the flotilla had to be abandoned.

The Red Cross also manned, equipped, and operated a number of hospital trains. At the beginning of the war it had entire charge of the service of evacuation from Port Arthur, Dalny, Dachichao, Inku, and Liaoyang to Mukden, supplying and manning the first 6 hospital trains. Thereafter it always took a most important part in the railway transportation of the sick and wounded. Some of its trains, about 10, called "white trains" from their color, contributed by members of the imperial family and wealthy aristocracy, were supplied with all possible comforts and many luxuries, the operating room, with all modern appointments, occupying an entire car, while the pharmacy and dressing room occupied another. Several of these "white trains" had a laundry and disinfection car; one had a complete ice plant with daily output of 4,000 pounds of sterilized ice.

Other Red Cross trains, 15 to 20, consisted of ordinary freight cars, with inside platforms built around the walls for the patients to lie upon, and were very much like ordinary military hospital trains, but provided with blankets, pillows, and other conveniences.

The Red Cross also supplied female nurses to all military hospital trains, and a large proportion of the bedding, dressings, and medicines.

All hospital trains, whether Red Cross or military, were in command of line officers, but the medical officers retained the direction of the personnel.

The Red Cross, during the war, became a complex organism consisting of various elements from very different sources, but all under the general direction of the executive committee and chief delegates.

These elements, or constituents, may be grouped into four classes, as follows:

1. The society proper, with its regularly and permanently organized branches, its numerous communities of sisters, and great resources in personnel, cash, and material.
2. The committees organized in all great cities by the zemstvos and municipalities.
3. The committees organized by various corporations, institutions, and associations, Russian and foreign.
4. Private individuals.

Thus in June, 1904, four months after the breaking out of hostilities, there were in operation 138 Red Cross hospitals and "flying detachments," with capacity for 15,055 beds. Of this number of beds, 7,320, or nearly one-half, had been provided by cities and zemstvos, 5,360 by the society, 1,340 by corporations and associations, and 765 by individuals. This total number was rapidly increased, but always with about the same proportion between the four groups. In December, 1904, the number of Red Cross hospitals and beds was as follows:

	Hospitals.	Beds.
Zone of active operations (Middle Manchuria)	[a] 98	[a] 9,005
Zone of Vladivostok	35	6,375
Zone of Chita	15	3,270
Zone of Irkutsk	80	4,200
Zone of Port Arthur	2	800
Total	230	23,650

[a] Included 22 field hospitals with 1,525 beds, and 28 flying detachments with 775 beds.

The Red Cross hospital accommodations continued to increase until the summer of 1905, reaching a total capacity of at least 30,000 beds, from Irkutsk to Vladivostok and from Kabarofsk to Kungchuling, 12,435 being in the zone of active operations, from Harbin to Kungchuling.

Harbin, from the beginning to the end of hostilities, was the great hospital center where all the sick and wounded were eventually transported for admission or distribution to other places. In November, 1904, the Red Cross had accommodations in that town for 2,245 beds, but they were rapidly extended so that, in January, 1905, the society could take care of 6,000, and, in April, of 7,385 patients in some 30 hospitals. All these Harbin hospitals were under the able direction of Prof. Eugene Botkins, of the Imperial Academy of St. Petersburg.

Of the constituent elements of the Red Cross, grouped under the third class, as above, we may mention:

The nobility of the Empire, ladies committee, Southeastern Railway, Protestant churches, Israelite Society of Odessa, Polish Society, Finnish Society, Merchants' Guilds of Nijni-Novgorod and Kharkoff, German Hospital, Dutch Hospital, etc. Of these the most important was the nobility of the Empire, which, by combined efforts established and maintained a base hospital at Harbin, the largest and best equipped of all Red Cross establishments in Manchuria; a smaller hospital; a flying detachment and transport column at the front; a hospital train, and a supply depot; all under the direction of Grand Marshal Michael Stackhovitch.

Of the individuals who founded and maintained hospitals those most deserving of mention, next to their majesties the two Empresses, are Countess Bobrinska (340 beds), Countess Shuvalov (100 beds), and Mrs. Boeckel (50 beds).

The buildings occupied by the society for hospitals purposes in Manchuria were of all kinds—barracks, hotels, clubs, theaters, workshops, private houses, etc. Its hospitals, in a general way, appeared to be more comfortable and better managed than the regular military hospitals, possibly because of ampler means. The personnel for 200 patients was 5 surgeons (chief surgeon in command), 1 commissary, 1 pharmacist, 15 sisters, and 20 feldshers and attendants; for

100 patients, 4 surgeons, 1 commissary, 1 pharmacist, 10 sisters, and 12 feldshers and attendants.

There was the same unavoidable crowding of beds as in military hospitals. These beds were of all types, most of iron with wire bottom, but a large proportion with board bottom or with the Chinese rope bottom. Straw ticks always took the place of mattresses. In the hospital supported by the Empress Maria, at Harbin, the bedsteads were of iron with canvas bottom, which could be tightened as desired. A canvas bag on each vacant bed contained fresh hospital clothing to be put on by the patient when admitted, and received his own soiled personal effects. Several hospitals were comfortably installed under canvas, like that of the Countess Bobrinska, near Kwan Shan, and that of the Countess Shuvalov, at Mukden.

The water supply was entirely drawn from wells and, even in Harbin, hardly ever distributed by pipes, so that bathrooms were scantily supplied and water-closets impossible, conditions which, in the field, are generally unavoidable. The hospital of the nobility (Dvoriansky) at Harbin, the largest of the Red Cross hospitals, was a striking exception, and modern in all its equipment. It consisted of 9 pavilions built for that purpose, each for 45 or 50 patients, with bathrooms and water-closets. The water was pumped by a steam engine into a tank and filtered through charcoal before distribution, that for drinking being boiled besides. This hospital had its own electric plant and a fine X-ray machine. Its disinfection plant consisted of three parts—steam chest, set of sublimate casks, and crematory, all under the same roof. Its personnel included 68 female nurses and about 150 male attendants. It had its own herd of cows, and before that had paid 50 cents for each quart of milk.

In all Red Cross hospitals the food, so far as I could ascertain, was good and well cooked, including everything needful, except milk, fish, and eggs, which, although not entirely absent, were seldom seen. Rather scant also were the various canned preparations of well-known digestible and nutritive foods. The cost of feeding patients, enlisted men, averaged about 38 cents per day, ranging from 24 to 50 cents, according to circumstances; for officers it was about double.

It is hardly necessary to say that, as a general rule, the supply of dressings, appliances, and instruments were sufficient and of good quality.

The chief surgeons were all men of mark, many of them university professors and among the most skilled operators in Russia. Especially conspicuous at the front were Doctor [illegible], of the Hospital St. George No. 1; Doctor Butz, of the Hospital of the Exaltation of the Cross; Doctor Dsirne, of the Hospital Stavropol; Doctor Sianojentsky, of the Hospital [illegible]; Doctor Von Manteuffel, of the Hospital of the Empress Maria, etc.

Earnest efforts were made to apply the principles of modern surgery, and the results, as shown in my first report, have far excelled those obtained in any previous war.

Red Cross hospitals enjoyed complete autonomy in their internal administration. Each chief surgeon received orders only from his delegate, and to him alone rendered all professional and administrative reports; but the delegates were under the command of the inspector-generals of the medical departments so far as their movements and sphere of action were concerned. This system appeared to work satisfactorily, the relations being such as to secure discipline and harmonious cooperation without friction and waste of effort.

When the final decision to abandon Mukden was taken, Chief Delegate [illegible], the personnel of two Red Cross hospitals (one under Professor Butz and the other under Professor Sianojentsky, both of the University of St. Petersburg) and that of a military hospital were directed to remain behind, surgeons, officials, sisters, and attendants, in all about [illegible] persons, to look after the wounded which could not be removed. They were treated with kindness and generosity by the Japanese, and in due time allowed to return with their patients into the Russian lines, an interesting episode highly honorable to both countries.

Very remarkable was the prompt and efficient action of the Red Cross in the early part of the war. As the troops were hurrying to the front it provided a large number of tents and set up small ambulant hospitals at points of rendezvous. When the chief delegate (Alexandrowsky) arrived at Harbin, on February 29, 1904, he already found two field ho-pitals organized. Other detachments arrived successively, some taking forty days en route, the quickest not less than twenty days, but by May 1, 1,370 persons were available. Hospitals had then been established in Harbin, Liaoyang, and Port Arthur. From the beginning the Red Cross, not content to work in rear, aimed to cooperate with the medical department at the front, sometimes taking its place. At an early date it pushed detachments to the south and east of Liaoyang. When, on May 1, occurred the first important battle of the war on the Yalu it was in a position to take care of more than 400 wounded. In all the other engagements which preceded the campaign of Liaoyang it likewise took an active part, especially at Vafandian and Vafanga, where it gave first help to a majority of the wounded.

The so-called flying detachments of the Red Cross worked on the battlefield and in the immediate rear, setting up their own dressing stations. They had a variable personnel, generally consisting of 1 surgeon, 4 medical students, 6 to 10 male nurses, and a few packers and drivers, the material being carried on pack horses or in carts.

These flying detachments, as well as the field hospitals, were badly handicapped for want of ambulances or other suitable vehicles to carry the wounded, as well as from a great scarcity of hand litters. In this respect the Red Cross was not worse off than the medical department and, like it, had to rely mostly on Chinese carts and small quartermaster carts. In fact, it was not quite so badly off, for committees from several cities, especially from the Baltic provinces, succeeded in forwarding some ambulances, or acceptable substitutes therefor, to the front, although too few to play an important part in the transport of the wounded. This absence of ambulances and scant supply of stretchers was one of the unpleasant surprises of the war.

As the war progressed and the medical department developed its organizations, the Red Cross reduced, to a large extent, its active operations at the front, leaving to the medical department the chief care of the wounded at the dressing stations and their transportation to the field hospitals, devoting itself to other fields of activity more in harmony with its material.

Its other noteworthy organizations not yet mentioned were:

(1) Feeding stations along lines of evacuation, sometimes between the zone of fire and the field hospitals, where wounded or exhausted soldiers could get hot soup and tea and often clothing. Here the work of the sisters is said to have been particularly efficient.

(2) Dental stations, one in Harbin and one in Mukden.

(3) Bacteriological laboratories, two stationary and five ambulant, one of the latter admirably installed in a special car. They were but little used.

(4) Three disinfecting detachments, with all necessary appliances.

(5) Infirmaries or dispensaries at all principal railway stations.

(6) A special hospital for sick sisters at Harbin.

(7) Several hospitals for the insane.

(8) Bureaus of information, correspondence, and for the distribution of gifts sent to individual soldiers.

What were the resources of the society during the war? At the time hostilities began it had 460 organizations throughout Russia and Siberia and a large personnel of trained sisters, probably not less than 3,000. Within a month or two the number of committees, big and small, had risen to 800. The objects and needs of the society were brought to the attention of everybody and contributions actively solicited on all sides. In its behalf were given exhibitions, concerts, theatricals, fairs, and bazaars, and imperial palaces were converted into workshops and storehouses. In all churches, public buildings, hotels, and places of amusement were little padlocked trunks bearing the ever-conspicuous red cross, and inviting donations. In cafés and restaurants match safes had little special appendages into which could be dropped one's spare kopecks. On June 1, after the first heavy expenditures, the society had an available balance in cash of over $4,000,000. The Government favored it in every possible way. For its benefit a surtax of 10 kopecks (5 cents) was put on every railroad ticket and one of 5 kopecks on every telegram. All imported articles intended for the society were admitted free of duty. Its hospital material was carried to the front by rail without charge and all other articles at a reduced tariff. It is roughly estimated that during the war the amount of cash expended, plus the material in kind distributed by the Red Cross, amounted to at least $20,000,000.

I may here refer to the help extended to Russia by foreign countries. It was, on the whole, but a poor return for the generous assistance which Russia had never failed to tender to all countries in need. Germany only gave help on a large and effective scale. The German Red Cross maintained a hospital of 200 beds at Kungchuling (between Mukden and Harbin), which, under its chief, Doctor Brentano, did most excellent work. The Dutch also maintained a small hospital in Manchuria to show their appreciation of the services of the Russian Red Cross in the Boer war. Bulgaria likewise had a hospital of 60 beds at Irkutsk. The Grand Duke of Hesse sent a field hospital for 50 beds with 20 light ambulances to Mukden but only a few days before the evacuation of that city. A committee of French ladies provided the necessary material for a hospital of 25 beds without any personnel; it also helped in outfitting the hospital ship *Orel* and contributed some supplies to the depot of Her Majesty the Empress in St. Petersburg.

In the field the Red Cross personnel consisted of delegates or directors, chief surgeons, surgeons, pharmacists, commissaries, students, feldshers, female nurses (sisters), and sanitars (male attendants). A great number of medical students volunteered for duty and rendered excellent services, especially at the front with the flying detachments. Feldshers, as already explained, are male nurses of experience and specially instructed, often doing the work of physicians. Officials and men wore the military uniform without sword, and as distinctive insignia the red cross on cap and shoulder straps. The men's cap had a red band piped with green, bearing in front a round white shield with a red cross in the center. The shoulder straps were blue. The overcoat bore on the lapel the same shield that was on the cap. The fur hat had a blue top crossed by two red lines. All wore, or were expected to wear, the brassard.

The pay of the Red Cross personnel was as follows: Chief surgeon, 500 rubles a month; surgeons, 350; students, 125 and their food while in the field. The feldshers were paid 75 rubles, the sisters and sanitars 30, with food and clothing.

The total monthly expenditures of the Red Cross in the zone of active operations in the first part of the year 1905 for salaries and purchases made in Manchuria were about 500,000 rubles.

Besides the many delegates, directors, and inspectors, mostly members of the aristocracy and high civil functionaries who devoted their time and energies to the work of the Red Cross with no other compensation than their daily food, mention should also be made of the women surgeons, of undoubted professional skill and executive ability, who were found in a number of responsible positions, such as Princess Gedroitz, chief surgeon of a hospital train: Countess Bobrinska, in charge of a large hospital; Madames Reno, Kerinska, Ottinger, etc.

The female nurses were of two classes—sisters or members of the Red Cross communities and volunteers. As the number of sisters was obviously insufficient an appeal was made for volunteer nurses, to which a large number responded, many from the aristocracy and the higher classes of society, making up in zeal and self-denial what they lacked in experience, and often spending their pay on their patients. A certain proportion were ignorant and otherwise objectionable women, but they were soon eliminated, so that at the time of my arrival in Manchuria, in January, 1905, I heard nothing but expressions of praise and satisfaction for the work of sisters and all other female nurses. As already stated, nearly all nursing in hospitals was done by women, not only in Red Cross, but also in all military hospitals. In January, 1905, there were more than 3,000 sisters in the zone of active operations and several thousand more in the other zones. They were not only in base, but also in field hospitals, and sometimes even at dressing stations, within sight and range of the enemy's fire. As I said on another occasion, "All honor to the Russian Red Cross sister! For natural aptitude, endurance of hardships, contempt of danger, and single-hearted consecration to her humane task she is unexcelled if not peerless."

REMARKS AND CONCLUSIONS.

In the light of the experience acquired during our civil war and all subsequent wars, especially the Russo-Japanese war, what may we think of the practical utility of Red Cross societies, either in peace to relieve the victims of famine, pestilence, and catastrophies, or in war as an auxiliary to the medical department of the army.

I believe all thoughtful military surgeons are agreed with philanthropists and humanitarians that such societies, in our modern civilization, are invaluable and indispensable. The less military a nation and the larger the volunteer element in the composition of its armies, the greater will be the need of civilian help in war. But however perfect may be the organization of an army and strict its discipline there will always be times and places in a war with a first-class power when the sick and wounded will be too numerous to be disposed of without long delays and much suffering unless civilian help is available.

Furthermore, modern war is no longer brought about by the mere will of a king or emperor, by a dynasty or private interests; it must be a national war; it will certainly be so in this country should we again be forced to take up arms in defense of our rights and honor. Therefore all classes of people, men and women, should be given an opportunity to contribute more or less directly to the comfort and welfare of the fighting soldiers and to the relief of the sick and wounded, and this can best be done through a Red Cross society, a society which, under the auspices of the Government, becomes the acknowledged recipient as well as dispenser of all private contributions.

Let us beware of disunion in our efforts to operate such a society. In peace and war there will always be enterprising and energetic persons, well-meaning, but misguided, who dislike to walk in beaten paths and be merely followers; especially when a war is imminent; they will desire to organize rival societies, independent of the National Red Cross. Such efforts should be frowned down upon; they tend to waste of energy, confusion, and inefficiency. Let it be understood that in time of war the National Red Cross only shall be recognized and admitted upon the zone of active operations.

A Red Cross society to be efficient must be not only well organized, but every member of it should acquire some practical knowledge of first aid and experience in handling patients. Therefore it must be a permanently active society, not only for work in time of war, but always ready to assist the victims of famine and all disasters in which public assistance becomes necessary. In such cases it should be the trusted public agent, the channel through which help is applied. In this manner will it become a familiar institution, brought to the knowledge of every American, winning his respect and obtaining his support.

I believe that a very important means of developing the Red Cross and attaining its objects is to follow the example of Russia and establish in all large cities special Red Cross hospitals for the gratuitous relief of the poor, and the instruction and training of its personnel. In no better way can the necessary experience be gained in the management of hospitals, a sufficient reserve personnel secured, or greater interest be aroused among the public in its aims and purposes.

However, in time of peace, it must never lose sight of its primary purpose, which is the care of the sick and wounded in war. Therefore it should plan and carefully work out a complete scheme of field organization, provide a sufficient reserve of trained personnel, and accumulate as large a cash balance as possible, so that when the emergency comes it may mobilize all its active forces promptly, thoroughly, and without confusion. Especially incumbent upon the Red Cross is the fitting out of hospital ships and sanitary trains; therefore all necessary preliminary measures should be taken to insure their being ready upon the beginning of hostilities. Also very important is it to enroll in its reserve all the eminent surgeons of the country for duty at base hospitals; at least all those unwilling to be mustered in the medical volunteer service.

We must assume that our National Red Cross, following the noble example of Russia, will intervene in foreign wars—that is, offer assistance to belligerents in wars in which we are not involved. It would then appear desirable that, with such object in view, cadres of suitable detachments of personnel, with necessary material, be worked out and kept on hand, so that the detachments may be readily mobilized at the proper time and shipped to the theater of hostilities without delay.

A very practical question for us is what rôle should our Red Cross play in the field. Should it, like the Russian and Japanese societies, in the ardor of its patriotism, seek glory on the battlefield under fire? No; this is not its proper place. Such work may have been necessary in the Russian army in the early part of the war on account of the insufficiency of the medical department (and the Red Cross should always be ready to give relief wherever needed and not otherwise provided for), but I believe it will obtain better results by limiting itself to its proper sphere of action, which is the rear, beginning with base hospitals and extending along lines of evacuation and repatriation to the soldier's home. I would not draw a hard and fast line, for we know how changeable, unexpected, and surprising are the conditions of modern warfare, and any rule we may formulate will always suffer many exceptions. There will be circumstances when the Red Cross may extend its activities to the field hospitals, and even, perhaps, to first-dressing stations. As a general principle, however, the medical department must be relied on for relief on the battlefield, at the dressing stations, and for the removal of the wounded to the field hospitals. This removal is the most important duty of the medical department at the front, and involves the use of ambulances and other vehicles or appliances which the Red Cross would seldom be able to procure.

What of the female nurses? What are their duties in the zone of active operations? In the Russian army they appeared to have unlimited privileges and were allowed to go to the edge of the battlefield and sometimes to dress wounds under fire. One had a limb shattered by a shell in the Liaoyang campaign, requiring amputation. Such heroism excites our admiration, but, in my judgment, is out of place. It should not be necessary and should not have been permitted. It indicates a defective organization of the medical department. The female nurse has no place on the battlefield nor at the first-dressing stations. The Hospital Corps of our Army, if what it ought to be, should be trusted to meet all the needs of these advanced positions. Whether it is best, as a general proposition, to have female nurses in field hospitals, as in the Russian army, admits of a difference of opinion, according to national characteristics, qualifications of the nurses, and efficiency of the hospital corps. Our service regulations do not provide for them in such situation, and, I believe, for good reasons. As a very general rule, therefore, the duties of female nurses in our service will begin at base hospitals and be conterminous and coextensive with those of the Red Cross.

A last question, and perhaps not the least, is, What should be the relations of the Red Cross with the military authorities? Should it retain its internal autonomy, as in the Russian system, or lose its identity and be merged into the medical department as in the Japanese system? Of course we admit that it must be completely subordinated to the medical department. The character and amount of its work and its sphere of action must be mapped out and determined by the chief surgeon of the army with which it is connected, under the approval of the general in chief, and all its professional returns and reports should conform with those of the medical department so as to secure correctness and completeness of statistics. Beyond this I do not think it wise to go. Military discipline and the same strict military system should not be expected from the Red Cross hospitals. It is therefore better to give them full freedom of internal administration and permit such methods as, under the circumstances, are likely to produce the best results.

The American National Red Cross having been incorporated by act of Congress and placed under the supervision of the Government, it may be assumed that its relations with the Medical Department in time of war will be explicitly determined and, when approved by the Secretary of War, made the subject of official regulations for the information and guidance of all concerned, so that when mobilized for the field both services may work harmoniously from the beginning without wasting valuable time in adjusting points of disagreement.

Report of Col. John Van R. Hoff, Assistant Surgeon-General, U. S. A., Observer with the Russian Forces in Manchuria.

NOTE.—Colonel Hoff arrived from the United States in St. Petersburg on June 9, 1905. On June 28 he proceeded to Manchuria, and arrived at Kungchuling on July 21. He remained on duty as an observer with the Russian army in the Far East until September 30, when he left Kungchuling for St. Petersburg, where he arrived October 17, 1905.

MEDICAL STATISTICS.

The morbidity and mortality bills which the Russian army has been called upon to meet from February 10, 1904, to September 14, 1905, exclusive of Port Arthur, total as follows:

TABLE I.—*The movement of sickness and wastage (from death and disability) among all grades of the (Russian) Manchurian field armies and services in rear of the same due to wounds and disease from February 10, 1904, to September 14, 1905.*

	Wounded.		Sick.	
	Officers.	Men.	Officers.	Men.
Sent to hospital	3,393	110,362	7,445	230,027
Dead, with organization	54	479	14 [a]22	185 [a]431
Died in hospital	147	2,861	125	4,665
Discharged for disability	....	8,237	....	16,018
Returned to duty	1,755	57,037	8,711	111,142
Evacuated (transferred)	1,461	41,635	2,585	74,713
Remaining in hospital	30	378	1,024	22,664
Remaining in convalescent institution	....	214	....	825

[a] From sudden death.

The foregoing table, which is official, presumably includes every case that appears on the hospital registers of the armies for which the medical department became responsible, together with 1,185 cases of death, with organization, making a grand total of 352,412 cases. Of these 8,983 died, 24,255 were discharged for disability, 120,394 were transferred to hospitals west of Lake Baikal, 173,645 recovered, and 25,135 remained under treatment.

I have no official writing as yet showing the mortality among the cases "transferred." This, with additional statistics, was promised to be sent me here, but I have a note of a personal conversation had with Doctor Kozlooski, the statistical officer, Harbin, September 22, 1905, during which he told me that the total mortality from disease was 18,830. Deducting the 5,442 deaths accounted for in the foregoing table from the number given by the statistical officer, and there remain 13,388 deaths which must have occurred among those "transferred," a rate of 173 per thousand. As only serious cases were, as a rule, sent away from the army, this rate, though high, may be regarded as not excessive. This deduction is, of course, open to correction.

TABLE II.—*Battle losses*[a] *(Russian army) during the war by months (Russian calendar).*

Month.	Killed.		Wounded and contused.		Died of wounds.		Missing.	
	Officers.	Men.	Officers.	Men.	Officers.	Men.	Officers.	Men.
1904.								
February		4		2				
March	1	8	4	16		5	1	3
April	26	623	50	1,130		12	4	474
May	4	56	16	285	2	31	6	71
June	19	668	133	2,926	2	73	23	1,166
July	27	974	189	5,350	12	113	19	928
August	91	2,243	477	15,379	26	326	18	1,957
September	107	2,433	474	16,847	23	232	23	2,306
October	83	1,842	406	13,511	22	530	18	2,526
November	2	98	21	708	6	91	1	28
December	11	140	59	704	12	59		63
1905.								
January	49	1,670	378	10,746	23	212	25	1,277
February	233	7,638	1,455	47,272	35	640	282	28,156
March	7	181	40	1,165	20	659		225
April		103	13	483	1	206	1	58
May	4	68	10	341	7	88		28
June	3	51	24	405	7	41		40
July			11	287	3	16		
August			19	150		6		
Total	667	18,800	[b]3,779	[c]117,707	201	3,340	421	39,306

[a] Exclusive of Port Arthur.

[b] Of these, 386 remained on duty.

[c] Of these, 7,345 remained on duty.

The foregoing table accounts for 184,223 cases, of which 19,467 were known to be killed and 3,541 died of wounds. Total, killed, 23,008; wounded, 121,486; missing, 39,729.

The extraordinarily large proportion of missing is accounted for by the fact that the Russians having been driven from every battlefield were forced to leave their dead to be buried by the Japanese, and as there were no means of identifying the Russian dead the Japanese could but bury them as "unknown," and the Russians carry them as "missing."

It is not to be presumed that any considerable number of the Russians deserted to the enemy; they could hardly expect a hospitable reception from the Chinese, and they could not get home, so it is safe to assume that practically all "missing" Russians were buried on the battlefield. As this fact is not susceptible of absolute proof, in making my estimate of "killed" I shall have to depend upon the statistics of other wars to reach a reasonable basis of calculation.

But before proceeding to a discussion of this question I will submit the following table of Russian losses by battles:

TABLE III.

Place.	Date.	Killed.		Wounded and contused.		Missing.		Strength.[a]
		Officers.	Men.	Officers.	Men.	Officers.	Men.	
The Yalu	Apr. 30–May 1, 1904.	26	564	38	1,081	6	679	....
Telissu.............	June 13–15, 1904.	18	459	85	2,155	10	754	....
Motienling.........	July 17–19, 1904	8	215	37	1,069	2	224	....
Tashihchiao	July 23–24, 1904	4	141	30	646	3	107	....
Yangtzuling	July 31, 1904 ..	10	349	42	1,192	2	219	....
Liaoyang	Aug. 24–Sept. 2, 1904.	87	2,027	414	12,486	10	1,461	156,600
Sha River..........	Oct. 8–18, 1904.	190	4,894	861	29,531		5,838	168,200
Chentanpu	Jan. 25–29, 1905	49	1,670	378	10,746		1,277	....
Mukden	Feb. 24–Mar. 14, 1905.	233	7,638	1,455	47,272	282	28,156	336,400
Lesser battles and skirmishes.	....	42	843	439	11,529	46	593	....
Total........	....	667	18,800	3,779	117,707	421	39,308	....

[a] The "strength" is given on the authority of General Kuropatkin.

Assuming that the proportionate losses at the battles of Liaoyang, Sha River, and Mukden are a fair index to the proportionate losses in other battles, it is not difficult to deduce the real strength of the Russian army in every battle nor to arrive at a reasonable conclusion as to total proportionate losses. The total casualties[a] in the specified battles are 21.45 per cent of the strength given by Kuropatkin. Of this total, 10.5 per cent were killed, 64.5 per cent were wounded, and 25 per cent missing, or 1 killed to 2.5 missing, to 6.5 wounded.

The statistics of the German army in their war of 1870 show a loss of but 4.12 per cent of the total force engaged, of which 0.75 were killed, 2.83 wounded, and 0.54 missing, or, roughly, 1 missing to 1.5 killed, to 5.66 wounded. If, then, we assume the German figures as proportionately applicable to the Russian army, we must take from the "missing" and add to the "killed" enough to make the proportion of 1 to 1.5. By reference to Table I it will be seen that 3,541 cases of wounds died, and it is more than likely that a proportionate number of the 13,388 estimated mortality among "transferred" cases died from wounds; but of these I have no record, and will leave them out of consideration in this report. Add the 3,541 wounded cases to the 19,467 killed, and the total dead from the "legitimate results of war" is 23,008, or killed and missing 62,737, of which we may assume from German experience that 37,642 were killed, making a total of 37,642 killed, 121,486 wounded, and 25,095 missing; total, 184,223.

I find it difficult to believe, assuming all the Russian prisoners in the hands of the Japanese to have been identified and reported, which I understand is the case, that 25,095 "missing" Russians are still in the land of the living. Yet this seems to be the only acceptable basis on which to work, and I will therefore adopt it.

By reference to Table I and comments thereon it will be seen that up to September 14, 1905, 18,830 soldiers had died from disease, which is almost exactly 1 to 2 dead from battle injuries. It may be safely assumed that this proportion will not vary by more than a small fraction when the final statistics are compiled, and it stands as the best sanitary record up to this war.

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[a] Exclusive of prisoners.

The Russian losses, by arms of the service, were as follows:

TABLE IV.

Arm.	Killed.		Wounded and contused.		Missing.		Proportional strength of fighting effectives.[a]
	Officers.	Men.	Officers.	Men.	Officers.	Men.	
							Per cent.
Infantry	602	17,873	3,246	111,309	379	37,789	84.4
Cavalry	20	366	159	2,060	20	395	5.0
Artillery	29	427	310	3,671	15	748	7.0
Engineers	4	34	42	282	2	126	3.0
Frontier guard	10	98	15	342	3	196	.6
Other services	2	2	7	43	2	54	(b)
Total	667	18,800	3,779	117,707	421	39,308	....

[a] I am indebted to Major Macomb for the estimate of proportionate strength.

[b] Embraces the noncombatant branches, the strength of which is 10 per cent of the fighting effective.

The military population which furnished the foregoing statistics has been variously estimated and generally overrated until after Mukden, since which battle it has probably been underestimated by all except the two most interested nations. I have no statistics as to the Russian strength before the date of my arrival in the Far East, but I have the unofficial statement of General Kuropatkin, which may be accepted as authoritative. He says (the reasons are not here necessary to enumerate) that "in spite of our (Russian) apparent superiority in number of battalions, we were always numerically inferior to the enemy. Thus at Liaoyang we had altogether 135,000 bayonets, at Sha River 145,000 bayonets, and at Mukden between 275,000 and 290,000. The exact figure has not yet been determined. In spite of this we took the offensive from Mukden, well knowing that the enemy was superior in number." Add to the foregoing 16 per cent to cover the other combatant forces present in these battles, and we find that the Russians had at Liaoyang 156,600, Sha River 168,200, and Mukden 336,400.

August 20, 1905, the chief medical inspector told me in conversation that the combatant strength east of Baikal was 870,000.

October 2, 1905, the statistical officer informed me that the total strength of the Russian forces east of Baikal on that date was:

In the field	729,000
Etape and rear	112,000
Pre-Amur district	116,000
En route from Russia	80,000
Total	1,037,000
Add 10 per cent for noncombatant services in the theater of war	95,700
Grand total	1,132,700

From these statistics it would appear that during the year 1905 Russia sent to the Far East nearly 800,000 soldiers, or an average of 100,000 per month, and at the time of the declaration of peace had assembled an army numbering more than 1,100,000 men, almost every one of whom had been transported over a single-track railway for more than 5,000 miles.

Having briefly considered the primary results of the war upon the Russian soldier, due weight being given to the fact that the statistics are necessarily tentative, I will invite your attention to some of the means by which these results were reached.

THE SANITARY DEPARTMENT.

Organization.—During the period of my service in the Far East the entire region beyond Lake Baikal was under the jurisdiction of General Linevich, the commander in chief of the Russian forces. The troops were distributed among four armies, First, Second, and Third Armies at the front and the Rear Army. Indeed there were five armies, the Fifth being in the pro-Amur district, which included Vladivostok.

West of the lake the line of communications was given over to institutions of the rear, which were controlled from St. Petersburg, the sanitary department of this region being under command of Major-General Chlinowsky, general staff, stationed at Irkutsk.

A word to recall the organization at army headquarters. Of the heads of the different staff corps those that have to do with inspections of special troops, supplies, pay, and audit report directly to the commander in chief. These are intendence (food, clothing, and forage), inspectors of artillery and engineers, chief paymaster, and controller. The so-called military staff, quartermaster-general, adjutant-general, and general of roads and communications, are directly under the chief of staff.

Among the subsidiary departments are the sanitary, the judge-advocate's, and chaplain's departments, which, according to regulations, are under the adjutant-general.

The organization of the sanitary department of the Russian army is sui generis, as laid down in regulations, and I should fancy more or less impracticable because of its complicated methods and divided authority. I am informed that the paper organization was largely disregarded and what was had was an organization devised by General Kuropatkin on the ground, probably to meet a threatened or actual breakdown. Under this plan the sanitary department was given an independent status with a chief reporting directly to the commander in chief. I endeavored to ascertain the reasons for the modified organization, but no one whom I asked was able or willing to answer. When I inquired of the chief medical inspector how the work of his department was done during the early days of the war, he replied that this had been made the subject of report to St. Petersburg, and said no more.

The situation must have been one demanding high organizing and administrative capacity, for the sanitary department was first placed under the command of General Trepov, who later returned to St. Petersburg to become chief of the general staff, and was succeeded in his sanitary duties by General Ivanov, a lieutenant-general of artillery. These officers were members of the staff of the commander in chief and reported directly to him.

The subdivisions of the sanitary department were: (1) the medical department, (2) the Red Cross, (3) the evacuation, (4) the veterinary department.

The senior representative of each of these subdivisions was in immediate charge of his own division and was a staff officer of the chief of the sanitary service.

Each of the five armies had a chief sanitary officer, a lieutenant-general or major-general, usually, though not necessarily, of the general staff with assistants representing the various subdivisions of his department, all of whom were independent of each other. I understand that there was a chief sanitary officer in each corps, and it was not until the division was reached that the medical officer had much administrative responsibility. A large number of line officers, probably not less than 500, were employed in various capacities in the sanitary department. Doubtless many of these were incapacitated for field service by reason of wounds or other causes. Line officers were on duty with field hospitals, railroad hospital trains, convoys, evacuation commissions, etc.

The total strength of the entire sanitary department was approximately 75,000, about 7 per cent of fighting effective.

Among the many things the interesting experience with the Russian armies in the Far East brought to my attention, those which, perhaps, most impressed me are the following:

First. Their appreciation of the necessity for an exact organization, as shown by their regulations.

Second. Their failure to observe the regulations and supply an adequate military medical organization, thus forcing the Red Cross to substitute, rather than supplement, what an army should always freely provide for itself at the front.

Third. The inadequacy of the number of trained personnel, especially among the men. The number was apparently sufficient, but so far as I could learn, in the matter of nursing, especially the men, were of small account, and the women, even though little trained, were relied upon for this essential work right up to the firing line. If hospital men are not taught and required to do nursing in peace time, they will certainly never learn it during war.

The permanent army physicians were, as a rule, not trained administrators, and the "reserve" physicians knew nothing of military matters. They were not trained because they were given no opportunity to become so. Their professional work was above criticism.

Fourth. An administration and execution following strict military standards. This certainly was the case in the Far

East, for much of this part of the sanitary work was done by purely military officers, who were not specially trained sanitarians, and it was apparently well done.

As the roster shows, generals of exalted rank were assigned to the duty of directing the sanitary department, and line officers were taken from their units to assist in administering this department, even though, as Kuropatkin said, their services were sorely needed with the troops.

I conclude from this that the Russians regarded the work of the sanitary department as of real military importance, and, having to choose for its directors between military men who were not sanitarians and sanitarians who were not military men, they properly selected the former. In making their selection it will be observed that high ranking officers were chosen as directors. There could be but one reason for such selection, the responsibility and arduousness of the work.

The application of this to our own service, it seems to me, is that our military sanitarians must be trained as administrators, and that the importance of their work should be recognized by other military men and regarded as real military duty.

Other impressions are noted in the course of the report. So far as I know, we have no sanitary organization back of the lines and nothing defining the relations of relief societies to the military body in active service.

THE MEDICAL DEPARTMENT.

So much regarding the organization of the medical department of the Russian army has been recently published that it seems unnecessary to burden this report with anything more than an outline of the peace organization.

Up to the present time there appears to have been a medical corps—i. e., a body of military physicians—but no medical department. This corps has at its head a chief military medical inspector, at present Doctor Spiranski, privy counselor (the third grade in the chin), assimilating to the rank of lieutenant-general. He presides over the central military medical board, whatever that may be, to which the military medical scientific committee is attached. As I understand it, the functions of this committee are to consider purely professional questions, to recommend sanitary measures, the establishment of hospitals, etc.; it also has supervision of the manufacture or purchase of medical supplies, and it keeps the medical statistics of the army. The central military medical board has jurisdiction over district boards and the medical inspector who presides over them.

The medical inspector of an army corps reports to the medical authorities of the district in which he may be serving, and his medical subordinates report to him. Of course all surgeons of whatever grade serving with troops are directly under military authority.

There is also a so-called central military sanitary committee, which is attached to the war council and which has to do with mobilization.

I was told that the chief military medical inspector has recently been made a member of the staff of the minister of war and in the absence of the latter is authorized to decide questions relating to medical affairs. Just how much authority he has over army physicians outside his own office I am unable to say, but I fancy not a great deal, as I was told that the general officers in the field usually selected their own chief medical inspectors, though the detail had to be confirmed by the Emperor.

In looking over the report of personnel in the office of the field medical inspector, Gobacevich, who was at the head of the medical department in the Far East, I found no "state" of underpersonnel.[a]

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[a] The functions of a field medical inspector who is under the immediate command of the chief of the sanitary service, are:

First. The assignment to duty of military physicians below the grade of division surgeons. (I understand that seniority within any grade may be ignored in making assignments, and a lower-grade official may be temporarily placed above one of higher grade, but the detail requires the authority of the Emperor to make it permanent.)

Second. The inspection of hospitals as to their professional features.

Third. The supplying of medicines, surgical material, hospital furniture, tools, equipment, clothing, etc.

Fourth. The keeping of a record of all sick and wounded.

Fifth. The informing of the commander in regard to the movement of sickness in his command.

Sixth. The making of sanitary examinations and the advising of the commander regarding the sanitary conditions.

From this I infer that he had nothing to do with the administrative control of the underpersonnel.

The permanent military medical staff is recruited chiefly from graduates of the army medical school, though any Russian physician may be appointed to the army by the minister of war, with no requirement beyond that of graduating at a medical school, no examination being at any time demanded for or after entrance, though I understand there is a period of probation before an appointment is made permanent.

All Russian physicians belong to the reserve and are liable for service until 45 years old. Unlike their colleagues of the German army, they have not up to the present time been required to serve in the ranks, and their work in times of peace is so wholly professional that, as a body, they know little of the duties of an administrative medical officer.

Military medical service is not popular in Russia, largely because the reward is not commensurate with the effort demanded, and, moreover, the status of the army physician—he not being an officer—is one of isolation if not ostracism. It is the old story—in a community where rank is the guinea stamp the man without the stamp does not pass current.

Like most other nations Russia has long maintained a military medical academy, from the graduates of which have come the larger part of her army and navy physicians.

It was my pleasure while in St. Petersburg to visit this magnificent institution, established by Peter the Great, and which celebrated its centennial about the time we were inaugurating our own modest army medical school. One is astonished at the extent and perfection of the plant. A stately academic building with capacity for 750 students, a completely appointed hospital of 850 beds, a medical library containing over 100,000 volumes and receiving 700 current medical publications from the entire world; anatomical, physiological, and bacteriological laboratories in a great building containing all the latest advances in apparatus and teaching appliances, a physico-chemical institution, a botanical garden, a laboratory of hygiene (established in 1865). Besides these there are a school for feldshers (male nurses), quarters for commandant (a physician), parks, etc., all covering an area of 100 acres in the heart of a great city and representing an investment of not less than $20,000,000. The students and personnel of this great institution number approximately 2,000.

The faculty consists of 34 professors and 70 assistant professors, in addition to whom there are 47 prosectors, curators, etc., exclusive of the clinical assistants and others directly attached to the hospitals.

The academy is not exclusively devoted to the education of physicians for the public service. Its doors are open to all medical students under the conditions of entrance, only those who are beneficiaries of the Government being held to service, at the rate of eighteen months for each year spent in the academy as a beneficiary—a maximum of five years.

Beneficiaries of the school are appointed by the minister of war from applicants who are graduates of a classical or real lyceum (gymnasium), corresponding to a collegiate course with us, culminating in a degree in arts or science. Latterly the standard was somewhat lowered, so that at present military cadets (graduates of the second grade military schools) and seminarists (graduates of ecclesiastical schools) are admitted to the academy. Candidates for the army or navy do not receive a money allowance until they enter upon their third-year course.

The curriculum of the academy is identical with that of the medical sections of the Russian universities. The first two years are devoted to the study of the natural sciences and the remaining three years to strictly medical subjects.

The money allowance is 420 rubles per annum, and from the date of its acceptance the beneficiary is in the service of the State. The number of such medical cadets allowed is 412.

Students who are not candidates for the public service pay a tuition fee of 60 rubles per annum.

The graduates number annually about 125, of whom the larger portion enters the services.

The military medical academy has other important functions which, however, are subsidiary to its primary object—the training of men for the medical corps of the army and navy—and need not be mentioned here.

I could not learn that there were any courses in this institution whose object was to impart a knowledge of those subjects special to the medical officer, as previously stated, the curriculum not differing from that in the other medical schools. The professors all have chin rank, wear swords, and are saluted, but so far as I could learn are not medical officers, as we understand the term, either in theory or practice.

General Kuropatkin, who has the reputation of being the most advanced military thinker in Russia, realized that the medical department of that army was archaic in organization, and recently, while minister of war, determined upon a reorganization on modern lines. I am told that he was impressed with the fact that the army physician, if he was to assume the administrative responsibility of the sanitary department, must have a sufficient military education to enable him to appreciate its relation to the other parts of the body military, and he had about determined to require of all candidates for the medical department a year's preliminary service in the line, such as is the case in Germany. As a beginning an edict was issued requiring the medical cadets to serve a number of weeks with the colors during the vacation season (June–September), and this, I understand, they were doing when the war with Japan began.

Appointments to the army and navy are not confined to graduates of the medical academy, but may be made from the alumni of any Russian medical school without examination other than that required by the school, and all graduates in medicine from all the universities are ipso facto members of the reserve. Such are not required to serve in the ranks, and are without military training.

It is needless to say that the position of the medical man in the Russian army is not desirable. As one of them remarked, "There is a huge book defining our duties, but not a word as to our rights," and no physician, either active or reserve, with whom I spoke regarding the matter was satisfied with the conditions.

The sociological situation in Russia is so peculiar that it is difficult for an outsider to gain an intelligent appreciation of it. The people are divided into two grand divisions, the civil and the military, both of which are mutatis mutandis organized on almost identical lines. The priesthood constitutes a third division.

The Russian army physician belongs to the civil official class; but he has no military rank and occupies an uncertain position somewhere between the chinovaik and the officer; he wears a uniform, as do all Government employees of whatever class, a sword, epaulets, and a cockade on the band of his cap. This last fact was pointed out to me with great pride by one of the brightest physicians I met as evidence of the fact that he belonged to the soldier class. He is also entitled to a salute. Whether he is accepted or rejected socially by the officers depends entirely upon himself, but he is really never recognized as one of them. He is, as a Russian remarked, "not regarded as their comrade, but as a foreign element in the regimental family." Intellectually he is usually much superior to his associates of the line of the army.

I have gone somewhat into detail as to the recruitment and status of the army physician, for we must study the man if we wish to find out the why and wherefore of results.

On permanently entering the army a physician takes the ninth civil grade, titular counselor, assimilating that of captain in the military grade. His official designation is Dr. ——— ———, T. C., though I am not sure that he must have received the doctorate or only a lesser degree.

Thereafter his promotion depends upon length of service, four years being ordinarily required in each grade until the sixth grade of the chin, collegiate counselor (assimilating colonel), is reached, after which promotion is made by selection, with the approval of the Emperor.

Doctor Gorbacevich, chief field medical inspector, is a civil counselor, assimilating major-general; he entered the service the same time I did and is about my age. Doctor Speranski, the senior official of the Russian military medical department, is a privy counselor, assimilating lieutenant-general; he is apparently a very old gentleman.

The pay of the army physician corresponds to that of officers of assimilated grade in other branches of the service, and will be shown in tables giving the organization of medical units. Increased pay and allowances are given for service outside of Russia, and I understand that army physicians are permitted to accept other opportunities of emolument when such do not interfere with their regular duties. Details to other branches of the public service are not unusual.

There is compulsory retirement for age in the Russian military service which applies equally to army physicians. Lieutenants must retire at 53 years of age, captains at 55, and those of higher grades, with exceptions, at 60. Should the physician have attained the office of medical inspector he is continued on the active list after reaching 60 years.

As the pension or retired pay is really part of the army physician's emoluments, I will here add a word on this subject.

The pension for twenty years' service is equal to half the pay of the next higher grade, and for thirty years full pay. When disabled the amount of pension is determined by the extent of the disability.

In addition to retired pay the physician as well as the officer becomes the beneficiary of an official insurance, called "emerital pension." The fund for this pension accrues from a deduction of 6 per cent from the annual pay of all officers, and reaches the beneficiary after he has served twenty-five years. Should an officer die or otherwise quit the service before completing this period, the amount actually paid in is wholly repaid to him, or in part to his heirs, the widow getting half and the minor children one-fourth.

Upon completion of twenty-five years' service the officer becomes a beneficiary and receives an annuity for his life, one-half of which is continued to his widow and one-fourth to his minor children.

The Alexander commission, founded and endowed by Alexander I, has for its object assistance to the needy military personnel, including their widows and children. In addition to the income from the endowment, the funds of this commission are sustained by sequestering the increased amount of pay of the first three months after promotion of all officers, by concerts, private contributions, etc.

In addition to physicians there are pharmacist officials who form a part of the cadre of the medical department. They, too, have rank in the chin, beginning somewhat lower than physicians, with the assimilated rank of lieutenant and ending with that of colonel. These officials are in charge of the dispensaries of the larger hospitals, of the supply depots, etc. All civil pharmacists belong to the reserve up to the age of 45 years.

Officials belonging to the intendance are usually on duty in the larger hospitals in connection with subsistence matters.

UNDER PERSONNEL.

The under personnel of the medical department is made up of women nurses (sisters), men nurses (feldshers), and orderlies (sanitaries).

There are also clerks, noncommissioned officers, etc., whose numbers are comparatively small, but who frequently come up to plague one in search of the details of the apparently complicated organization.

Women nurses have been employed in the Russian army ever since the Crimean war. There is, however, no nurse corps in that army, and no training school.

Training schools for nurses are maintained in many of the larger hospitals of Russia and Siberia. The oldest, largest, and most influential of the nursing sisterhoods is that known under the title of the Society of the Sisters of St. George, located in St. Petersburg. So far as I could ascertain, the course of instruction, covering two years, was on the same plan as in our schools, and the outcome quite up to our best results.

The employment of nurses in Russian army hospitals is entirely a local affair, and is in the hands of the local medical authority. Should he desire a nurse, he sends to the nearest training school and one is sent. If she is not satisfactory, she is returned and another sent to replace her. The nurses always continue their connection with their own sisterhood or training school, and look to it in all that a home implies.

I am told that there is ordinarily no difficulty in getting all the trained nurses desired, who are employed in number averaging 1 to 20 beds. (More in Red Cross hospitals.) The nurses have a status somewhat higher than feldshers (noncommissioned officer, hospital corps); they receive in home hospitals 20 rubles monthly and on the frontier or during war 30 rubles. They are boarded and lodged, and when these allowances are commuted the rate is the same as for a subaltern officer, 1.5 rubles per diem for subsistence and 75 kopecks for quarters.

In each hospital one of the nurses is detailed as head nurse, but her pay and allowances remain the same as for the other nurses.

I am told that the service is generally liked and the nurses often remain until superannuated. There is no retiring allowance, but there are several homes for aged and infirm nurses supported by private contribution.

At the beginning of the war the trained nurses volunteered in large numbers, and well met the emergencies of that most trying period of a military medical department. But the supply was soon exhausted and was reenforced by the good women of the country who, actuated by patriotic motives, volunteered in large numbers. These women, oftentimes the wives or daughters of officers serving at the front, many of them delicately nurtured and highly educated, were required to take a short course (six weeks) in a hospital before enlistment. At the close of the war 75 per cent of the so-called " trained " nurses were of this class.

Of course they were not "trained," but I have no doubt their ministrations were far more acceptable than those which otherwise would have had to be given by rough soldier hands even less " trained " and certainly far less intelligent.

I found women nurses in the mobile field hospitals at the extreme front, and heard of their being at the dressing stations in the very midst of battle; indeed, several of them lost their lives on the field. The concensus of opinion among army physicians is that their proper place is in fixed hospitals at the rear, where they can be suitably surrounded and where they can do their best work. One day returning from the extreme front I met in the railroad train a "sister," almost a child in appearance, who was the daughter of a general officer on duty in the lines. She told me that she had volunteered for the war from patriotic motives, and to fit herself for the work took a three months' course in one of the hospitals at Moscow.

She had been on duty on a military hospital train for a year, plying between the front and Harbin, with occasional trips to Irkutsk. The train on which she was serving was made up of freight cars, with passenger cars for the personnel.

Her duties consisted in taking charge of the sick in four cars, administering remedies, looking after diets, linen, and other property, and attending to the police of patients and cars, in which she was assisted by a "sanitary" (orderly), one to a car. In turn, she was detailed for the day on duty in the kitchen, where she verified the diets, seeing also that they were properly cooked and served, though she had nothing to do with the actual cooking.

The senior nurse had charge of all the nurses, and her assistant was in charge of the linen. I might add that the train, consisting of 30 cars, was commanded by a line officer and had 2 physicians, 5 sisters (nurses), and 30 sanitaries (orderlies).

The instruction of the male underpersonnel runs in about the same lines as with ourselves. The chief medical inspector informed me that after the annual maneuvers a certain number of men were told off for special instruction in hospitals. This was given by the physicians, but they gave no other instruction to the men, this being done by their own officers.

Except the feldshers, the medical department has no underpersonnel that actually belongs to it, such as it has being detailed from the active troops in peace times and the reserve in war. These soldiers when so detailed are called "sanitaries;" they remain under command of their own officers, who are detailed to medical units.

The military feldsher corresponds to our noncommissioned officer of the Hospital Corps, with far less responsibilities. Like the physician, his work is technical; he is nurse, dresser, dispenser, clerk, but has little or nothing to do with administration or discipline.

The feldsher has the same professional status in Russia as the practicante has in Spain or the like in other countries. He is not a physician, but has a legally recognized status and is allowed to undertake simpler medical practice. In civil life he "is the peasants' doctor, elected and paid by them. He must have passed some preliminary examinations and have had a certain regular training before he obtains his diploma," etc.

I have already referred to the great feldsher school in connection with the military medical academy in St. Petersburg. Such schools are also established in every large garrison town; moreover, men are instructed in regimental schools by the surgeon. The latter, I am told, are usually not so well instructed as are those taught in the regular schools.

The character of the instruction given in the regular feldsher schools is indicated by the following curriculum, taken from official sources:

Theology.
Russian language.
Latin.
Arithmetic.
Geometry.
Drawing.
Geography.
History of Russia.
Penmanship.
Zoology.
Botany.
Physics.

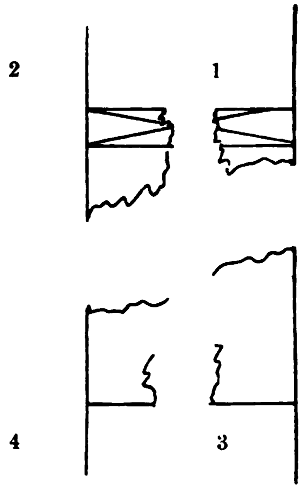
Anatomy.
Physiology.
Pharmacognosis.
Chemistry and pharmacy.
Pharmacology.
Prescriptions.
Pathology and therapy.
Diseases of children.
Surgery.
Desmurgy.
Mechanurgy.
Massage.
Care of ill and injured.
First aid.
Poisoning.
Hygiene.
Venereal diseases.
Skin diseases.

Women are received as pupils in these schools and practice as feldshers. Midwives are educated in special schools.

All male feldshers, like physicians, belong to the reserve.

The consensus of opinion is that the feldsher is an indispensable part of the military medical personnel; he is in the Russian service, within the limitations of his work, what our noncommissioned officer of the Hospital Corps is in our service, and is very much in demand.

The Russians have a bearer drill. Each litter has four bearers, who take posts at the litter as follows:



From double rank:

2 1

4 3

The method of lifting the patient is the same as we formerly had, the relative positions of the numbers being different.

1

2 4

3

The passing of obstacles, the placing of a patient in the saddle, carrying upstairs, and loading of ambulance are all as we used to do.

The use of litter slings is not shown in the illustration, but I saw them in practice, and when they were not used the litter was almost invariably carried on the shoulders of the bearers.

One day while watching Chinamen carrying wood aboard a steamboat on the Sungari River I observed a method of using slings that struck me as exceedingly practicable. The load, weighing in the neighborhood of 500 pounds, was carried by two Chinamen on two poles about 10 feet long. The bearers stood one at either end between the poles and supported the load by slings passed over one shoulder, thus avoiding the uncomfortable pressure at the back of the neck. This way of using the sling is applicable to our new drill, as thereby the front bearer has simply to slip the sling from the shoulder and drop it when the litter is lowered.

Regarding general instructions in first aid I heard different stories; some told me it was given and others said it was not. I think both were right. The instruction was probably given in those organizations where the commanding officer and the surgeon appreciated its necessity and neglected in others. I saw plenty of sick and wounded carried on litters, but no bearer drill.

We have glanced at the man, let us now consider the machine.

Field sanitary organization in all armies is essentially the offspring of war and has no existence in peace times. It must be organized at the moment of utilization, and like all new machinery is sure to work roughly and unsatisfactorily in the beginning. At the start it is almost always underengined, for in the throes of war the killing department must take precedence over the curing, and when it is a question of bullets or bandages the bullets necessarily always win. War is not waged for the purpose of succoring the wounded. Then, too, the engine crew is almost entirely unaccustomed to the machine and must learn it as it is being driven at full speed.

The logical deduction from this is that the least friction will result if all the material for the engine has been assembled and the principal personnel assigned in advance to specific work in setting up and running the machine, so that the underpersonnel will know at least where it belongs and can be quickly taught what it has to do.

Russian soldiers are too well versed in the theory and practice of war to fail to have appreciated the requirements of a military sanitary department in active service, and if these requirements were not met, it must have been because of exigencies, some of which can be surmised, though none is absolutely known to me.

I am informed that the actual mobilization of military hospital accommodation was 420 beds per division with the troops, 420 beds immediately in their rear, and 840 beds in reserve, making a total of 1,680 beds, 8.4 per cent of the effective; or, eliminating the division and mobile field hospitals, 4.2 per cent for the base, which is 6 per cent less than experience has taught us is necessary.

General Kuropatkin stated that when the war broke out, Russia neither expected nor was prepared for it. The demand for soldiers was imperative, and the very limited resources of the uncompleted trans-Siberian railroad had to be devoted to the transportation of men and material absolutely essential to their fighting efficiency. This is one probable reason why the units mobilized by the medical department were inadequate.

Later this defect was measurably remedied by the Red Cross mobilizing a duplicate medical department, so to speak, without which there must have been a serious breakdown in the sanitary arrangements.

The scheme of field organization followed the lines which experience has taught to be the most practicable and which I will now endeavor to describe. It was essentially the same as that of the Japanese, which is modeled on the German system.

The sanitary organization directly attached to active units has a continuing existence and is practically the same in peace and war. The regulation allowance of personnel, material, and transport therefor is as follows:

PERSONNEL.

Lazarets with troops.	Infantry regiment.	Battalion artillery, park brigade.	Cavalry or Cossack regiment.	Artillery brigade.	Horse battery.
Surgeon	1	1	1	1	1
Assistant surgeons	4	1	1	1	....
Feldshers, senior	1	1	1	2	1
Feldshers, apothecary	1	....	1	1	....
Feldshers, junior	12	1	7	8	1
Feldshers, students	14	4	6	4	1
Feldshers, company	....	4	....	....	....
Hospital sergeant	1	1	1	1	....
Orderlies	3	2	2	4	1

MATERIAL.

Number of beds[a]	16	4	6	6	4
Litters	32	8	....	12	2
Bearers, company	128	32	24	36	6
Ambulance wagon for 5 patients (4 lying and 1 sitting)	4	1	2	3	1
Knapsacks, feldshers', in each 10 dressings	16	4	....	6	....
Medical chests, in each 50 dressings	....	....	6	....	1
Medical knapsacks, in each 20 dressings	32	8	....	12	....

HOSPITAL COMFORTS.

Conserves:					
Soup	80	20	30	80	....
Meat	80	20	30	30	....
Fruit extract.....pounds	2	¼	1	1	....
Sugar.....do	24	6	10	10	....
Tea.....do	4	1	2	2	....
Wine.....bottles	8	2	2	2	....
Vodka.....kegs	1	....	....	....	....
Do.....bottles	....	4	6	6	....

TRANSPORT.

Wagons, 2-horse	1	....	....	....	....
Ambulances, 4-horse	4	1	....	3	....
Carts, hospital, 1-horse	4	2	3	3	2
Carts, veterinary, 1-horse	....	....	1	....	....

[a] Usually 1 tent is issued.

As a matter of fact, there were considerable departures in the Far East from the allowance above outlined, as was to be expected.

As I understand it, during peace time we must make the most perfect organization and plans for active service we are capable of, and in war endeavor to come as near to them as possible, but can never hope to reach their full measure. Actual war is always a compromise between the best and the possible.

The dispensaries, or lazarets, as the Russians call them, with the troops in active service, were opened only under exceptional circumstances for the care of hospital cases.

Such cases were sent to the division field hospital at once or as soon as possible, so that all of the sanitary resources of the combatant units might be free and ready to accompany the commands to which they belong. The Russians quite appreciated that a regimental hospital for the treatment of protracted cases is an anomaly in war; if it is to accompany its unit it can not entertain such cases, and if it does not accompany it, then it ceases to be a regimental hospital.

In battle the regimental sanitary personnel organized advanced dressing stations, to which the wounded were brought by the company bearers and where they received such treatment as they might require or the circumstances would permit.

The vehicles pertaining to the regimental lazaret were placed conveniently near at hand, under such shelter as was available, and were employed in carrying the wounded back to the main dressing station of the division.

All organizations in rear of the firing line which pertained to the medical department in the field came into existence only when the army was mobilized, some as a development from existing elements and some de novo.

The Russian military medical department mobilized the following medical units: (1) Division lazarets, (2) field hospitals, (3) rest (etape) stations, (4) convalescent depots, (5) sanitary convoys, (6) sanitary railroad trains, (7) field supply depots (dispensaries), (8) intermediate supply depots (dispensaries).

THE DIVISION LAZARET.

The division lazaret was the central feature of battlefield sanitation, its function being the initiation of the great scheme of evacuation of the wounded, for which, so far as I know, our regulations make no provision, though its satisfactory performance demands a necessarily intricate organization and exact execution.

This organization, of which there was one per division, consisted of a dressing station section and a transport section, the personnel of which was as follows:

Office.	Number of personnel.	Annual salary with proper deductions.				Rank of office.	Class of pension.
		Pay proper.		Ration allowance.	Increased ration allowance (war).		
		Peace.	War.				
MEDICAL STAFF.							
		Rubles.	*Rubles.*	*Rubles.*	*Rubles.*		
Division surgeon	1	507.00	759.00	829.20	331.20	6	4
Division surgeon, assistant	1	414.00	621.00	553.20	276.00	8	5
Junior surgeons	3	333.00	498.00	276.00	220.80	9	6
Feldshers:							
Medical, senior	1	60.00	90.00	....	....	....	....
Medical, junior	2	36.00	54.00	....	....	....	....
Pharmacist, senior	1	60.00	90.00	....	....	....	....
Veterinary, junior	1	36.00	54.00	....	....	....	....
INTENDANCE AND TRANSPORT.							
Officer: Inspector and commander of bearers	1	(*a*)	....	600.00	....	....	....
Official assistant to inspector	1	420.00	630.00	420.00	....	9	7
Clerks:							
Upper grade	1	36.00	54.00	....	....	....	....
Lower grade	1	24.00	36.00	....	....	....	....
Orderlies (unassigned conscripts):							
Senior	2	24.00	36.00	....	....	....	....
Junior	20	2.70	5.25	....	....	....	....
BAGGAGE.							
Warrant officers:							
Senior	1	18.00	27.00	....	....	....	....
Junior	1	4.05	7.80	....	....	....	....
Bearers:							
Sergeant-major	1	24.00	36.00	....	....	....	....
Warrant officers—							
Senior	4	18.00	27.00	....	....	....	....
Junior	12	4.05	7.80	....	....	....	....
Privates	200	2.70	5.25	....	....	....	....

a According to rank.

RECAPITULATION.

Surgeons	5
Feldshers, hospital corps	5
Officer	1
Official	1
Clerks	2
Orderlies	22
Noncommissioned officers	19
Privates	200
Total	225

The division lazarets I inspected were in camp, and, so to speak, out of commission. These organizations had no defined functions off the battlefield except to serve as a reserve from which physicians and other personnel could be drawn for temporary work with other medical units in the division. The apparently large amount of transportation was also available for this purpose.

Those organizations which fell under my observation coincided quite closely in personnel and outfit with the regulation requirements, though all four-wheeled ambulances were eliminated. The military officer on duty with the lazaret seemed to be in command, was addressed as "commandant," and was usually sent for when I wished any information outside of purely professional matters.

I found considerable variety in the views of the physicians on duty with the lazarets as to the exact functions of this organization and how its work is done. It is but fair to say that most of those I questioned on this subject were reserve surgeons, recently arrived and without practical experience on the field. Those who had been at the front during the active period of the war were well informed in this matter, though hazy as to details.

As there was no battle while I was in the Far East I saw no dressing station in operation, and am obliged to rely upon the statements of eyewitnesses as to their working.

The division lazaret was the medical headquarters of the division, where the division surgeon was to be found during battle, and from which he supervised the work of his department.

The lazaret established a principal dressing station, to which, theoretically, all the wounded of the division were brought. Exactly how this station was organized I am unable to say, but I presume on the same lines as in other armies, which have under one or another designation sections for receiving the slightly wounded, dispensary, operating, kitchen, miscellaneous, etc. At the dressing station the wounded were given such professional treatment as was absolutely necessary, were fed, and finally transferred back to the division field hospitals by the transport section of the lazaret, or received religious consolation and were buried.

The Russians at the beginning, being far outnumbered by the Japanese, had no recourse but the Fabian policy of fighting and falling back, until time enough had been gained in which to assemble their forces and create an army. The fighting consequently always occurred along the line of the railway. Indeed this road was the peculiar tactical feature of the war; without it war could not have been carried on, and yet had it not existed there would have been no occasion for this war. It cut a stupendous figure in the immediate evacuation of the wounded, who were frequently sent from the dressing station, usually established in some joss house or finca near the railroad, directly to the hospital trains. Otherwise the wounded were as rapidly as possible sent back to the division or Red Cross mobile hospitals and thence to rear by rail.

By this means the Russians managed to get most of their wounded away, and though some hospitals remained on the field after the Russians retreated, in several battles, the number of wounded left behind was comparatively small.

A Russian physician, relating to me his experience at a dressing station during the battles of the Sha River, said:

> The dressing station was established at a convenient point, somewhat sheltered from fire, though an occasional shell would fall near by and the location was too exposed to permit the wheeled transportation to approach. The personnel consisted of 3 physicians, 3 sisters, a few feldshers, and some 15 sanitarians. An attempt was made to organize the station systematically and conduct it in an orderly way. At first but few wounded were presented, and the required records were kept, but soon the battle became fiercer and fiercer, the maimed came in by scores and hundreds, and there was hardly time to render professional aid, leaving wholly out of consideration the keeping of records, so the wounded were bandaged as rapidly as possible and passed to the rear. There was much confusion and disorder, and presently the sanitaries shirked, being worked out, but the surgeons and the sisters worked on for twenty-four hours continuously until upward of 2,000 cases passed through their hands. Such patients as required it were sent back on litters by hand to the field hospitals, and thence were transferred to the hospital trains.

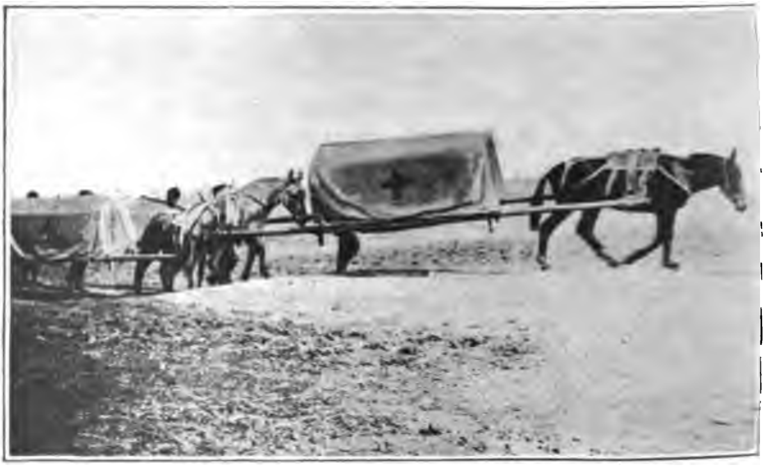
The collecting of the wounded, the rendering to them of first aid, and their transportation to the dressing stations is the specific duty of the company and divisional bearers, and no other was authorized to leave the ranks for this purpose. I am told that the regulation was not strictly enforced; that often the wounded were accompanied by other than company bearers, and in numbers in excess of the necessities of the cases. I presume this has been so in every war, and will continue to be, yet it is my conviction that specifically designated and marked company bearers should be part of the war organization of every unit, not only for the efficiency of the work, but as a deterrant against one cause of unauthorized absenteeism from the firing line. No company bearer was permitted to go behind the regimental aid station, and his work of collecting the wounded was done under the supervision of a regimental line officer. The transport column or ambulance company was responsible for the transfer of the wounded from the regimental aid stations to the dressing station, for which purpose the regimental medical transport might be used. It had a liberal personnel and transport. The variety of vehicles issued to it were, from one cause or another, gradually reduced to the simplest form, the dvukolka, or cart, of which there were altogether 64, or were, in the seventeenth division, nineteenth corps, for example, each capable of carrying two patients most uncomfortably.

The regulation transport of the division lazaret was 3 carts (1-horse), 15 wagons (2-horse), 9 ambulances (4-horse), 4 horses (mounts), 3 horses (spare), and 117 hand litters.

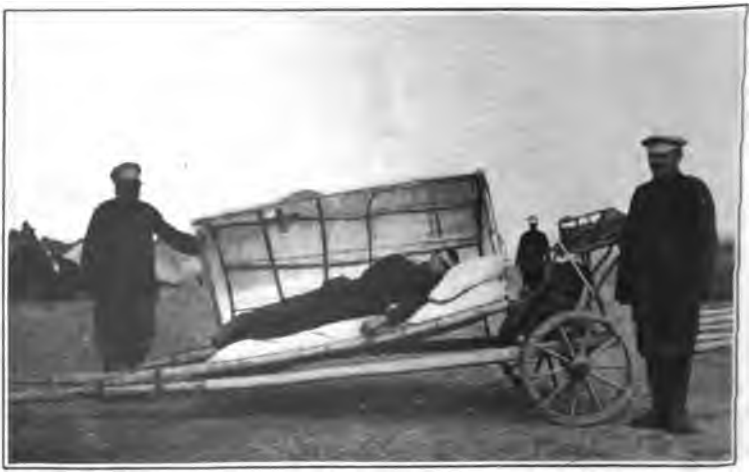
It is hardly necessary to say that the regulations were not—indeed, could not be—strictly observed in the Far East. The four-wheeled ambulance was said to be too heavy for roadless Manchuria, though I think the real reason why it was not used was the difficulty in transporting such vehicles by rail, and the sick transport resolved itself down to the simplest elements.

The Russian cart was taken as the unit. This is a springless, one-horse vehicle, very practical for the transportation of inanimate things, but entirely inappropriate for the carriage of the wounded. The body of the cart is about half the size of that of our escort wagon, being 5 feet long. The sides, 2 feet high, sloped somewhat, giving a width at the floor of about 30 inches and at the top of 36 inches. With the tail gate lowered one man could lie extended with room enough, but two men would have to fit in spoon fashion. On heavy roads an extra horse was hitched at the side, or one on either side, of the shaft horse.

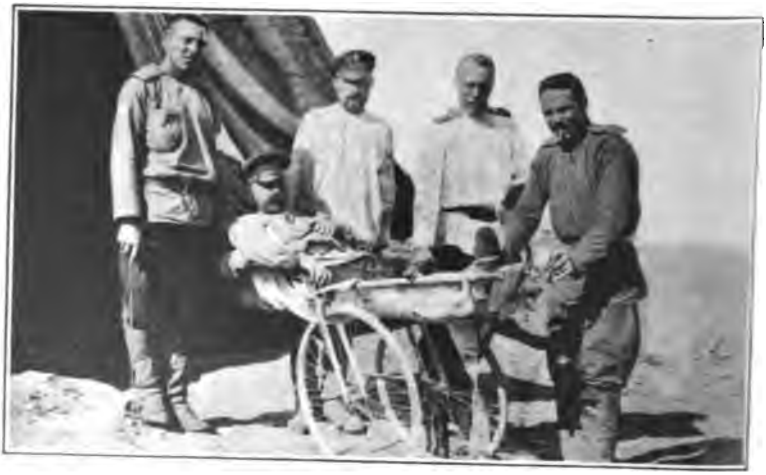
It was necessary to improvise a practical means for trans-



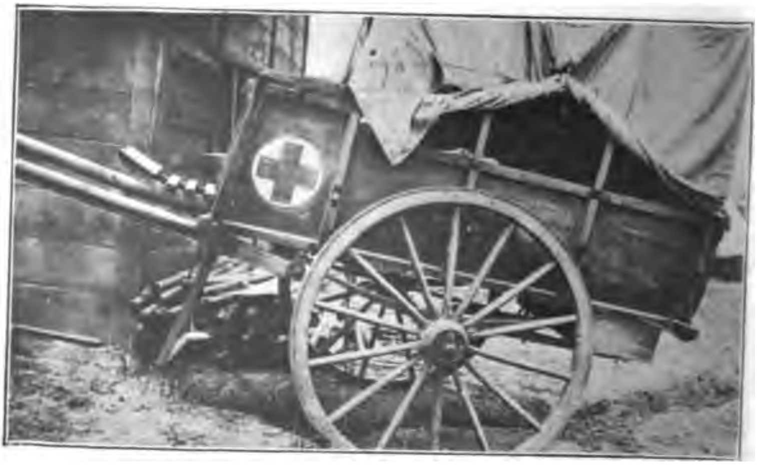
HORSE LITTERS.



WHEELED TRAVOIS.



WHEELED LITTER.



FINN CART AMBULANCE.

porting the wounded, and, as was to be expected, these improvisations took the form of the horse litter and the travois.

The horse litter was regarded as the most comfortable; but as it required two animals to carry one man, it was too expensive for general application.

The wheeled travois was found to be very comfortable and had certain advantages, as it furnished transportation for the driver as well. It is interesting to observe that it followed the plan of a travois devised by Captain McDougal, of our Army, many years ago, though the McDougal travois was without wheels, which I think an advantage.

Special two-wheeled ambulances were used by the Red Cross "flying detachments."

The four-wheeled vehicles, when there were any, were used for the transportation of matériel.

The division lazaret had four hospital tents. These tents were more than twice the size of ours, being 25 by 40 feet and 15 feet to the ridge, with accommodation for 20 patients. I thought them much too large and unwieldy, and those with whom I discussed the matter agreed in this opinion. The Red Cross avoided them and used other patterns.

The equipment of the lazaret was entirely an emergency outfit. To be sure there were surgical instruments, but these were only for surgical emergencies. The patients who came under the care of this organization were transients, to be gotten rid of as quickly as possible. No provision was made for their permanent care, and none should be, for were this done the lazaret would become a field hospital, which is not its object. Colonel Havard, in speaking of the division lazarets, said he noticed "a general laxity of discipline and want of organization, as if nobody was in command or responsible." It has not been my fortune to see such an organization operating under the stress of battle, but from what has been told me by eyewitnesses and what I have read I am constrained to believe that the management of a dressing station in battle is a stupendous task, and its success depends upon experience, or, lacking that, rehearsal—in a word, frequent drills. An army that waits for war to develop all its divisional sanitary personnel will pay largely in the diminished efficiency of its fighting units—the soldier man in suffering and the nation in prestige—not to mention pensions. I might add that before a battle the division lazaret, which with other divisional medical units belonged to the first line of the train, joined the second, going behind the company ammunition carts and in front of the artillery park.

FIELD HOSPITAL.

(210 beds.)

The regulation personnel of the mobile field hospital was as follows:

Office.	Number of personnel.	Annual salary with proper deductions.				Rank of office.	Class of pension.
		Pay proper.		Ration allowance.	Increased ration allowance for war.		
		Peace.	War.				
MEDICAL DEPARTMENT.		*Rubles.*	*Rubles.*	*Rubles.*	*Rubles.*		
Chief physician	1	414.00	621.00	553.20	276.00	8	5
Assistant physician:							
Senior[a]	1	414.00	621.00	558.20	276.00	8	5
Junior	2	333.00	489.00	276.00	220.80	9	6
Director of pharmacy	1	387.00	582.00	553.20	....	8	2
Feldsher:							
Medical—							
Senior	8	60.00	90.00	....	....	....	....
Junior	4	36.00	54.00	....	....	....	....
Pharmacist—							
Senior	1	60.00	90.00	....	....	....	....
Junior	1	36.00	54.00	....	....	....	....
Veterinary, junior[b]	1	36.00	54.00	....	....	....	....
INTENDANCE.							
Inspector	1	600.00	900.00	600.00	....	8	6
Assistant inspector	1	420.00	630.00	420.00	....	9	7
Bookkeeper and clerk	1	300.00	450.00	300.00	....	9	7
Priest	1	900.00	1,080.00	....	....	....	....
Psalmist	1	240.00	360.00	....	....	....	....
Women nurses[c]	4	360.00	....	....	....	....	....
Clerks:							
Higher grade	1	36.00	54.00	....	....	....	....
Lower grade	2	24.00	36.00	....	....	....	....
Hospital inspectors:							
Surgeon, sergeant-major	1	36.00	54.00	....	....	....	....
Junior—							
Armorer	1	24.00	36.00	....	....	....	....
Subsistence	1	24.00	36.00	....	....	....	....
Laundry	1	24.00	36.00	....	....	....	....
Ward master	2	24.00	36.00	....	....	....	....
Ward inspectors:							
Senior	5	12.00	18.00	....	....	....	....
Junior	20	9.00	13.50	....	....	....	....
Servants	34	2.70	5.25	....	....	....	....
Drivers:							
Warrant officer—							
Senior	1	18.00	27.00	....	....	....	....
Junior[d]	1	4.05	7.80	....	....	....	....
Privates	26	2.70	5.25	....	....	....	....

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[a] A division mobile field hospital is allowed 3 senior surgeons.

[b] Reserve field hospitals have no veterinary feldsher and but 2 drivers.

[c] Women nurses receive quarters, fuel, lights, and food of the officer standard. The men, of course, receive rations, quarters, etc.

[d] Two for reserve hospital.

RECAPITULATION.

Surgeons:		Nurses, women	4
Field hospitals	4	Hospital noncommissioned officers	6
Division hospitals	5	War orderlies	25
Pharmacist	1	Servants	34
Feldshers:		Transport:	
Field hospitals	9	Noncommissioned officers	2
Division hospitals	10	Privates	26
Officers or officials	2		
Priest	1		
Psalmist	1		119
Clerks	4		

It will be observed that the foregoing table, unlike that of the personnel of the division lazaret, does not provide in specific terms for a line officer, but for an "inspector," or superintendent, whose pay is greater than that of any other connected with the hospital.

Existing regulations specify that the senior physician on duty with the field hospital shall command it. This seems to be a concession to modern ideas, but as during peace times Russian military hospitals are commanded by line officers and little or no opportunity is given army physicians to learn administration, it is not surprising that in war the command often continues with the line. I found this to be the case in some instances, the surgeon not understanding administration, being willing to relinquish authority that he might be relieved of responsibility. However, as increased emolument went with the responsibility, it was usually accepted by the physician.

Of the 8 hospitals per division mobilized by the Russians for Manchurian service 4 were mobile and 4 were fixed. Of the 4 mobile field hospitals 2 were assigned to each division and were controlled by the division commander and 2 were held in reserve under the direction of the chief of the sanitary service. The latter were always in immediate touch with the troops and ready to supplement or substitute the division hospitals.

On the march at least one division hospital invariably accompanied its command. Both hospitals marched with the medical section of the divisional transport, and their function was to receive the wounded from the division lazaret during and after battle and at other times the sick from the troop lazarets.

The division hospitals were required to be evacuated at the first opportunity and never immobilized for any length of time. They might be emptied into the mobile field hospitals immediately at hand or their sick transferred to the fixed hospitals farther to the rear.

The fixed or " reserve " hospitals were established on the line of the railroad well to the rear in more or less permanent structures. These organizations had the same personnel (except for the transport) as the mobile field hospitals, like them were designated by number, and when needed as field hospitals could be quickly developed into mobile organizations. In practice the " reserve " hospitals were often combined into 420 or 630 bed hospitals.

The regulation transport for a mobile field hospital was as follows:

Carts, one-horse	4
Wagons, two-horse	19
Ambulances, four-horse (four-wheeled)	2
Horses, riding	4
Horses, spare	3

Several of the wagons were used for the transportation of the personnel, the rest for matériel, of which they carried about as much as our escort wagon. The ambulances were substituted by carts. There was no absolutely fixed allowance of tentage; three were regularly allowed, the idea being that ordinarily the hospital would be established in some convenient building, but as there were few such in Manchuria, the division hospitals were in tents, an average of ten hospital tents being used for ward purposes.

There was furniture for sick officers only. When the camp was more or less permanent, platforms were made on which the sick soldier men were laid, but otherwise they lay on the ground, over which was strewn a litter of straw or leaves, etc., or on litters. In the fixed hospitals there was of course more or less furniture, some of which was of iron and quite up to date. Very good bedsteads of wood were made in Harbin, where I saw them in use. I might here state that I presented three of our field cots to the Russian medical authorities, and they seemed very much pleased with them, Doctor Gorbacevich saying that he should recommend their adoption in his service. I saw nothing that could compare with our cot in efficiency and portability.

The matériel of the mobile field hospital was packed in 36 boxes, weighing either 140 or 280 pounds each, and the bedding in sacks. The armamentarium was simple, very few tablets were used, and the ensemble was in no wise comparable with ours, which I believe is unequaled anywhere.

Permanent hospital accommodation is provided in fortresses for 12.5 per cent of the strength of the garrison. When additional accommodation was required, fortress temporary hospitals with beds for 20 officers and 400 men were organized. The personnel of this hospital was just double that of the field hospital, i. e., the inferior personnel, there being of course but 1 chief surgeon, 1 inspector, 1 priest, 1 psalmist, and no transport personnel. As a matter of fact the field hospital of 210 beds seemed to be the unit, and all other military field or temporary hospitals were simply multiples of this, both as to personnel and matériel.

In addition to the hospital accommodation above set forth there were at the disposal of the commander of the army:

First. All permanent hospitals, military and civil, in the region occupied by the army.

Second. Foreign and newly opened hospitals in allied and neutral countries in accordance with special conventions.

Third. Hospitals belonging to the enemy taken according to the rules of war.

Fourth. Medical institutions of the Red Cross societies.

Besides the military personnel proper, all persons in any way attached to the army or its transport service and all sick military prisoners were admitted to military hospitals for treatment.

At all étape points there were rest stations which might be called emergency dispensaries. These institutions had accommodation for a dozen transients, but their chief work was in the out-patients' department, where a greater or less number of patients, men en route to or from their commands, reported throughout the day for treatment. Ordinarily these stations had a personnel of one or two physicians, a nurse, dispenser, cook, and a half dozen orderlies, depending upon the demands made upon the particular station. In addition to the étape dispensary at Kungchuling there was a first-aid station in the railroad depot at which a surgeon and nurse were always on duty. I was informed that over 10,000 cases had there received professional assistance.

The Russian regulations provided for the establishment of convalescent depots for from 50 to 200 men, weaklings, slightly wounded, or those not requiring regular hospital treatment. These depots might be established in connection with fortress or nondivisional hospitals or separately.

At Harbin a section of the city was given over to this purpose and was known as "Convalescent Town." There were accommodations for a large number of men, but while I was in Manchuria there were very few occupants.

In addition to the transportation pertaining to troop and divisional sanitary units heretofore noted, there was provision made for hiring or requisitioning transportation for the transferring of sick and wounded (1) from the troop lazarets to hospitals; (2) from the division larzarets to hospitals; (3) from one hospital to another, to railroad stations, wharves, etc.

This transportation might be utilized in carrying men who have been returned to duty back to their commands, etc. Such transportation was organized in so-called "convoys," each capable of transporting 200 men—140 sitting and 60 recumbent—and could at once completely empty a mobile field hospital. The regulation transport consisted of 7 two-horse wagons, 28 four-horse wagons, and 1 cart. These convoys were usually under the control of the medical inspector of the army, but might be assigned to specific organizations as corps, divisions, or detachments, and even to hospitals.

Like other sanitary units in Manchuria, the transport was resolved into its simplest elements. The personnel of a sanitary convoy was as follows: Officer,. 1; physicians, 2; clerk, 1; feldshers, 4; orderlies, 19; drivers, etc., 73. I understood that 7 such convoys were organized.

Should the sanitary convoys be inadequate to the required duty, the transportation pertaining to the mobile hospitals, or to the troops generally, might be used.

As previously stated, the railroad was a large factor in the strategy of the recent war in the Far East, and it certainly cut a considerable figure in the distribution of the ill and injured. There were 78 hospital trains, more or less, constantly on duty, of which 38 plied between the front and

Irkutsk, 22 between Irkutsk and Moscow, and 18 between Umsk and Moscow.

These trains were of two classes—one permanent, made up of specially arranged cars, with accommodation for 250 patients, and the other temporary, usually made up of freight cars (21 by 9 feet), and accommodating from 250 to 400 patients. The permanent trains were known as military and Red Cross, five of the latter being the "white" trains, veritable traines de lux, presented and supported by members of the royal family, except one furnished by the "richest woman in Russia."

The permanent trains had 14 Pullman cars (so called because they have four-wheeled trucks), 10 for wards, 1 for administration and officers' quarters, 1 for surgical operations, dressing, and dispensary, with quarters for nurses, 1 for kitchen and messroom, and one for underpersonnel. In addition there were usually 3 or 4 freight cars for stores, ice, etc.

These trains were commanded by line officers, the rest of the personnel consisting of 3 physicians, 1 intendence official, 5 women nurses, 5 feldshers, 33 sanitarians, 1 cook, and 9 mechanics.

The cars assigned as wards were arranged for a proportionate number of severe and light cases, 32 of the former to 18 of the latter. The severe cases were placed on litters in two tiers parallel with the long axis of the car, according to the Kruger system. The lighter cases were in bunks attached to partitions transverse of the cars, having an aisle at the side.

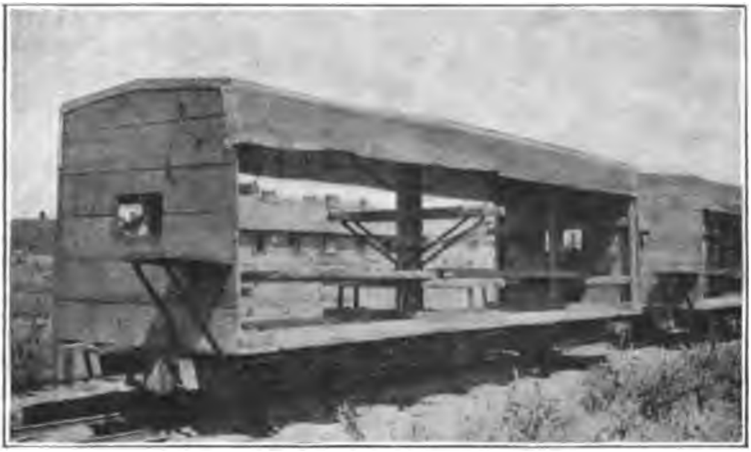
The kitchen was equipped with a modern range and all utensils necessary to Russian cooking. The cook might be soldier or citizen as the circumstances determined. The serious objection to this style of car was the difficulty in loading it, as the end door and crooked passageway would not permit the entrance of a loaded litter.

Prince Vicilchikov, the principal delegate of the Red Cross in the Far East, was of the opinion that the "temporary" hospital trains made up of the ordinary freight cars were much more practicable for ordinary use than were the permanent trains.

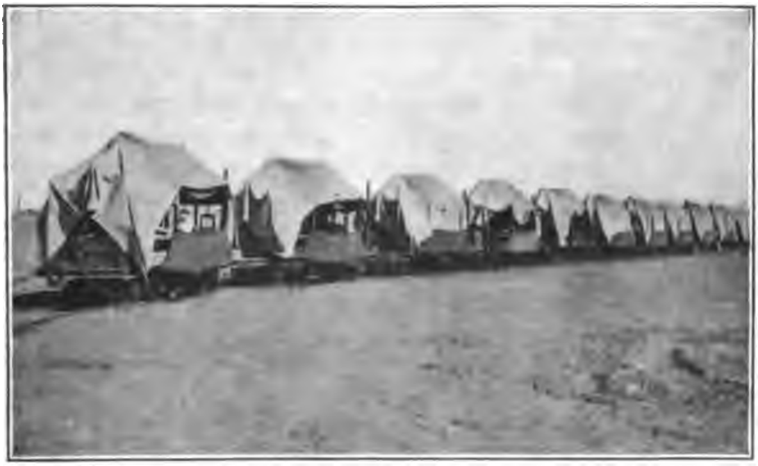
The temporary trains having been largely used in the immediate theater of war, their arrangement and equipment were closely studied. The following are some of the suggestions which have been made:

All interior fittings should permit of easy removal, disinfection, and cleaning; they should be of such character that their removal and replacement could be done in a few minutes, say ten minutes for each car; and they should be folded to permit of close packing. The entire equipment should be capable of storage in three cars. The side entrances should remain as now, one on either side, and of ample size. The car should be well lighted, capable of being heated, and should have a kitchen (field) and water boiler. Proper provision should be made for the personnel, at least two "Pullman" cars, and there should be a car for dispensary and surgery, also an ice car. One-fifth of the accommodation should be for serious cases.

Professor Manteufle, who was principal consulting surgeon in Manchuria, asserts that the use of the ordinary passenger car for hospital purposes is impracticable, the upholstered seats of the first and second class cars do not permit of satisfactory disinfection, while the fixed wooden seats of the third class are filled with cracks and crevices. Manteufle says that he knows of but two comfortable types of beds suitable for use on temporary hospital trains, viz, litters on horizontal springs, the Kruger system of permanent trains, and the other in which the ordinary stretcher is suspended, or rather the handles rest upon spring brackets. The latter is the method of the German Red Cross, the apparatus consisting of four tubes, each tube containing two brackets playing in slots and resting on spiral springs. The tubes are secured to ceiling and floor, and each set accommodates two litters, one above the other. By this method 12 litters can be placed in an ordinary freight car, and by crowding room can be found for 4 more. Various methods of suspending the litter were employed, including the well-known method Zavodosky. The latter was not regarded as satisfactory, as the suspending ropes communicated too much motion to the litter. The simplest and quite satisfactory way was to rest the handles of the litter on two planks placed transversely across the car and secured to the opposite walls at a suitable height. The serious objection to the use of the



DECAUVILLE RAILROAD WAGONETTE FOR SICK.



DECAUVILLE RAILROAD HOSPITAL TRAIN.

freight car was the lack of end-to-end communication. Various experiments were made to overcome this difficulty, none of which was satisfactory. Manteufle stated that through communication was impracticable without undue loss of space, and he had no substitute to suggest except the keeping of an attendant in each car and putting the serious cases in " Pullman " cars.

The Fogelsong field kitchen was found most useful in connection with the temporary hospital trains.

In concluding the subject of railroad transportation I will say that the Russian surgeons seem to agree that appliances for the transportation by rail of the ill and injured in war must be of such character that they can be readily fitted to ordinary freight cars, for it is only by the employment of such cars that the sudden and enormous demands of modern warfare can be met.

The great question of supply and resupply seems to have been satisfactorily met by the medical department during the late war, though I observed that the Red Cross supply depot seemed to be a much busier place than the military medical supply depot. The regulations say that " for the supply of medical material to medical units with troops and to field hospitals field dispensaries are, when necessary, established in the theater of war; they draw their supplies from permanent medical supply depots, and, if such are too distant, from temporary intermediate depots."

The central supply depot of Russia is located at St. Petersburg, under the administrative control of the chief medical inspector (spiranski). Here is manufactured much of the matériel of all kinds used by the medical department, including medicines and instruments; there are also principal depots at Moscow, Bobr, Kiev, Tiflis, Omsk, Tashkent, Dvina, Brest-Litovski, Warsaw, Kremenchuz, Kazan, Khabarooka, at some of which certain special work, such as the preparation of sera, is done.

At Harbin were installed a supply depot or magazine, as it is denominated, which supplied the rear army and the depots and a field medical supply depot for each of the three front armies, while at Kungchuling was a flying or advance depot located on a train of cars.

This advance depot was organized when there was but one army, with a " magazine " at Harbin, and was attached to the first army. With the organization of separate armies a separate supply was also organized, but it was not found necessary to locate the depots farther to the front than Harbin, about 150 miles back of the lines. Requisition was made directly upon its own depot by each unit of each army, except the first, and the material was sent out direct from Harbin. The advance (railroad) depot resupplied itself from its own depot in Harbin.

The personnel of the magazine was as follows:

Director of store	1
Pharmacists:	
Senior	2
Junior	3
Bookkeeper and corresponding secretary	1
Bookkeeper and corresponding secretary, assistant	1
Pharmaceutical feldshers:	
Senior	3
Junior	4
Clerks	4
Surgical-instrument maker	1

The personnel of the depot was as follows:

Director and senior pharmacist	1
Pharmaceutical feldshers:	
Senior	1
Junior	2
Servants	6
Surgical-instrument maker	1

The personnel of the advanced (railroad) supply depot was:

Chief apothecary	1
Apothecaries	2
Feldshers	4
Sanitarians	8

It had 8 cars, of which 1 was a passenger coach used as an office and quarters for officials. Of the 7 freight cars, 1 was used for underpersonnel, 2 for packing materials, and the remainder for stores.

The armamentarium medicorum in the printed supply table consisted of 99 medicines. To these were added 21 more or less recent remedies, a concession to the " reserve " physician, as follows: Tannalbin, asperin, bismuth salicylate,

cupri citrate, diuretin, fluid extract hydrastis canadensis, adonalis, vernalis, lanolin, hydrargarum, amydoto bichlor, menthol, protargol, urotropin, xoroform, adrenalin hydrochl., santonin, extract felix mas, cocoa butter, salol.

The supply table fixed the allowance for each unit, and this had to be maintained by requisition made as frequently as necessary. An abstract of issues and receipts was kept by the supply official, which, with the receipts from the surgeons, constituted the papers of the office. The accounts will be settled at the close of the war. Requisition for supplies received the approval of the chief medical officer of the organization, above the units, but in case of emergency issue could be made direct and the case reported. In war the routine of the depot was somewhat relaxed. Requisitions were necessarily made by the requiring officer, but the rest of the paper work was done in the depot. Two receipts were made out, which were signed by the receiving surgeon. One of these was sent to the chancery at Harbin and the other retained by the issuing official. No invoices were given. It might be well to here state that each medical unit had a fund which, among other purposes, could be used for emergency purchases of medicine.

The various remedial and preventive toxins were freely used in the practice of Russian physicians in the Far East.

The supplies appeared to be sufficient in amount and variety, but in comparison with our own seemed very simple. In fact, this might be said to be the case with everything relating to creature comforts. There was enough, and what there was, so far as I could see, was not wasted. Doctor Botkin, speaking of the matter of supplies, particularly in the field, said: " In the aggregate there was enough, but it was not always where it was wanted." At Vladivostok there were over three years' supplies on hand.

Regarding the transportation of medical supplies, this was done by the department of roads and transportation. In active service, when small lots were to be transported, they were sent direct to the railroad station master with a request that they be shipped. Carload lots were sent only on the order of the officer in charge of transportation, and this was the case with all shipments in peace times. The request for transportation must of course originate with the shipping officer.

The interior economy of the Russian military hospitals does not differ greatly from our own, except in the simplicity of equipment and economy of management, their standard being the ruble's worth, while ours is the dollar's worth. I made the following note of a visit to the military (venereal) hospital at Irkutsk. This hospital was located in a substantial barrack of ancient construction and not particularly fitted for hospital purposes. It had accommodation for 120 patients, with the regulation staff provided for such sized unit except women nurses. A company of the line, under its own officers, was attached to the hospital and supplied under the personnel and the necessary guard.

There was an official of the intendence whose special duty was to take charge of the mess, etc. "The furniture is quite primitive. The cots or bunks have sawbuck legs and board bottoms. These are furnished with bed sacks filled with straw, changed monthly, and covered with a double cotton sheet, one edge of which was pinned to a coarse blanket of felt-like appearance." At the time of the visit the hospital contained very few patients, and its appearance was as good as structural conditions permitted. The operative room was primitive; it had a folding operating table of wood, strong, but not very ingenious. There was an excellent field operating case, new and quite up to date. As this was not an operating hospital, I presume a complete operating outfit was considered unnecessary. I inspected the kitchen and bakery, and tasted the soup and black bread made there, both of which were very palatable. The table furniture consisted of a tin bowl and a wooden spoon. There was, however, no table, or rather mess room, the food being served in the wards. There were two messes, one for the patient and the other for the soldier orderlies. The latter were allowed 15 kopecks daily for housekeeping purposes. Of this, 10 kopecks were expended for meat and vegetables and 5 kopecks for bread, tea, laundry, etc. The sick were allowed somewhat more. It might be well to state here that the ration allowance for all varied in different places according to market prices, and was fixed by the general commanding. During the latter days of the war it was about a ruble. I saw a number of officers in this hospital in wards in a separate building. They were allowed 35 kopecks for ration. There was a laundry in connection with the hospital in which women were employed. The rule of the hospital was that all patients on entering should don hospital clothing. This consisted of a suit of white pajamas and a coarse brown woolen dressing gown. The patient's own clothing was washed and kept in a locker room until the man was sent out. The sanitary appliances were very primitive, there being no waterworks or sewers. I saw one bathroom with three tin tubs, the water for which had to be pumped in from a barrel, and the waste ran out into the street gutters across the sidewalk. The dispensary was primitive. The hospital records were kept with less view to determining a pensionable status than are ours; they will be mentioned more in detail later. I inspected many other and better hospitals than this one at Irkutsk, those at Harbin being on a very high plane of efficiency in all respects, while the naval hospital at Vladivostok was quite the finest hospital I saw while abroad and well worth description here. My notes made at Vladivostok, September 18, 1905, read as follows:

"The naval hospital at this station as it now stands has been built about ten years; it has a capacity of 630 beds, and in its interior economy is ahead of all the hospitals I have seen in the Far East." (It was really about the only permanent hospital there.) "The plan of the main building is that of a central corridor with wings alternating on opposite sides. There are several appendixes to the hospital (in separate structures); indeed, the main building is entirely given over to the actual care of the sick. The out-patients' department with its dispensary is at one end and above it are the officers' wards. At the other end are wards for women, wives of officers, or others attached to the service, and between are wards for the sailor men, together with operating room, surgical dressing rooms, X-ray rooms, laboratory, etc. The chief dispensary (really a medical supply depot) is in a large separate building, under the immediate charge of a pharmacist official, with three assistants (feldshers). Here there is a fine working chemical laboratory. The kitchen, bakery, and laundry are together in a separate building.

There are also eye and ear, venereal diseases, and infectious diseases clinics, each in separate buildings. There are quarters for officers, a chapel, etc., but sui generis is a bombproof ward tunneled under a hill to meet the emergencies of a siege and bombardment. All buildings are heated by steam and lighted by electricity." There were other military hospitals worthy of description did time and space permit.

It might be well to add a few words further regarding interior economy and records.

The commandant of the field hospital, by regulation the senior physician, paid the entire personnel of his hospital from public funds which he drew on his own check from a depository (bank) after having submitted an estimate of funds. This money was put in the hospital safe, on which an armed soldier constantly sat. The surgeon commanding also purchased all matériel for his hospital, except, ordinarily, medical and surgical supplies. He fed all, and clothed as well, the enlisted personnel, both well and ill. The accounts, which were apparently carefully kept, were audited each month by a company (hospital) council made up from the physicians on duty in the hospital. A written order was given for the purchase of everything required. which was filed in the order book, and becomes a sort of voucher to the account. I did not understand that receipts were taken. The accounts were open to audit by an inspector when the responsible officer was relieved or the hospital discontinued. I understand that 10,000 rubles was the average amount of the fund. All unserviceable property was sold by the responsible officer and the proceeds taken up in his money account.

Each patient on entering a hospital was given what might be called a "diagnosis sheet," containing the usual data, name, organizations, etc. On this sheet the case record was kept, and when the patient was disposed of it was sent to the statistical bureau. All these sheets were duplicated in a book which corresponded to our register of patients. No nominal reports of sick were made, but the completed hospital register was finally sent to the office of the chief medical inspector, St. Petersburg.

The following professional reports were made:

1. Daily numerical report of sick under general classification (21 headings), sent to local authorities.

2. The daily reports were consolidated and submitted weekly, with report of personnel, to the field medical inspector.

3. Monthly numerical report with more detailed classification (123 headings), sent to the statistical officer of the army.

4. Trimonthly numerical reports, consolidation of the monthly reports sent to statistical officer of the army.

5. Annual numerical reports, about same as foregoing.

I inquired why so many reports of the same kind were sent to the same authority, and the reply was "For verification purposes." This, however, seems improbable, and I presume the reports were required for different bureaus of the Government.

A " disposition " book was kept in which the name of every patient disposed of in any way was entered. The slip, which was a duplicate of the stub, was sent to the office of the chief medical inspector, St. Petersburg. There was also a " transfer " book with stub and duplicate slips, one of which went with the man to his destination and the other to his company commander. I heard the familiar complaint about the amount of clerical work.

So far as I could understand the Russian system of hospital records and reports, it seemed rather involved. There were apparently too many reports of the same kind required, all of which except the weekly report could have been compiled in offices at the rear where there was no other work to be done. To be sure, numerical reports require much less work than nominal reports, but no unnecessary report should be required of a field unit. A formal method of notifying a commander of an absent organization of the receipt and disposal of his man seems to me desirable.

The foregoing brief résumé of the medical department of the Russian army, I trust, gives a fair idea of its organization and work in the Far East.

I am required to give the proportion of medical personnel to combatant force. I was never able to get from the Russian authorities a specific answer to this question, and if answered at all it must be by estimating the regulation allowance rather than by quoting an official " state." Doctor Gorbacevich's statement of the personnel reporting to him, previously quoted, throws some light upon the question. He said, further, that on August 20, 1905, there were 280 field hospitals in operation east of Baikal, in each of which there were employed besides the physicians a maximum of women nurses, 9 feldshers, and 115 "sanitaries" (1 "sanitary" to 8 patients, and the others as cooks, drivers, etc.).

If we assume that there were twenty-three army corps in General Linevich's command (I have the designations of twenty-one, not including the pre-Amur troops, and Kuropatkin's authority that there were 1,030,000 fighting men in the East), there should have been 92 division hospitals, 92 mobile field hospitals, and 184 reserve field hospitals.

This coincides quite closely with Doctor Gorbacevich's report of August 20, provided it excluded the division hospitals, which is undoubtedly the case, as they were under the respective division commanders, whereas the mobile field and reserve hospitals were under the chief of the sanitary department of the entire army.

The sanitary personnel of an army corps is as follows:

Physicians	75	Clerks	2
Pharmacists	4	Orderlies	212
Veterinarians	5	Noncommissioned officers	58
Officers and officials	9	Privates	582
Nurses (women)	18		
Feldshers (all classes)	290	Total	1,415
Underinspectors and ward masters	134		

This is 3 per cent of 46,300, the total strength of an army corps, exclusive of the company bearers, which add more than an equal per cent in actual battle.

The extra divisional medical units were:

	Number.	Physicians.	Others.
Mobile field hospitals	92	368	10,5
Reserve field hospitals	184	736	16,5
Railroad hospital trains (military	60	180	3,24
Sanitary convoys	7	14	6
Supply depots	5		9
Administration, receiving hospitals, rest stations, etc., estimated		50	5
Total		1,348	31,661
Add the sanitary personnel of 23 army corps		1,725	30,
Grand total		3,073	62,4

This I believe to be a close estimate of the number of people actually employed in the military medical units in the Far East, of course exclusive of the personnel of the Red Cross institutions. Add to the strength of the 23 army corps (1,064,900) 5 per cent for the noncombatants not included in the corps (53,245), and we have 1,118,145, which closely approximates the number given by the statistical officer as the total strength of the Russian forces in the Far East.

The percentage of medical personnel to total strength was 5.8 per cent, exclusive of Red Cross and other auxiliary personnel.

The percentage of military physicians to total strength was 0.27 of 1 per cent. These figures, I believe, closely approximate the actual numbers of the military medical personnel.

The attitude of the Russian army reserve physician toward his service is not without its lesson for us. Quite two-thirds of the surgeons in the far East were from the reserve, they knew nothing of the military phases of their duties, which, fortunately under the Russian organization, was of little consequence to that army, and they served unwillingly, having left home, family, and business to take part in a war in which they had but slight interest. Moreover, they resented their status not only in relation to their own medical superiors, whose superiority they regarded as official only, but to the military officer as well by whom they were looked down upon. They considered themselves unjustly treated both as to rank and pay, and I have no hesitancy in saying that a very large proportion of the reserve surgeons would not have entered the army had they not been compelled to.

We must bear in mind that these gentlemen are in all respects, except that of compulsory service, on the same footing as our civil practitioners, and of all officials I came in contact with they were the most anxious for peace, and most desired to get home after peace was decided upon. It is probable that the chief reason for this lay in the fact that they were solicitous as to home affairs, as a physician's business is wholly personal and can not be delegated for any length of time. A protracted absence means annihilation of a practice which might have taken years to build up. However, these men did their duty well, and their complaints were whispered.

Looking back to our experience in the Spanish-American war, I am impressed with the similarity of views held by the Russian reserve physician and our own volunteer surgeons. The same criticism of their superiors, not loud there, but deep, due largely to ignorance of the conditions and limitations of war practice, and the same desire to get home to family and business after the first flush of adventure had passed, and the awful grind of unaccustomed field work pressed in upon them.

I think they had legitimate cause for complaint, because their positions were anomalous, a fact largely due to hereditary sociological conditions, which savor more of the fifteenth than of the twentieth century. I also think that our volunteer surgeons had legitimate cause for complaint because of their anomalous status, not due to caste, but to defective military organization. We had physicians commissioned as division surgeons, brigade surgeons, and regimental surgeons of volunteers, all with the rank of major. And the former were often placed in high administrative positions over their fellows whose commissions, carrying the same rank, antedated theirs. I think with hardly an exception the regimental surgeons held commissions in our volunteer forces in 1898 antedating those of the division surgeons under whom they served. The absurdity of such a situation needs no comment. No man should be commissioned to an office—we learned that in the civil war—he should be appointed to a corps or arm with what rank the appointing authority may determine and assigned to an office. Moreover, I am of the opinion that the office should often carry local rank, so to speak, so that the proper man might be selected for detail to it no matter what his rank in his corps. If our regimental surgeons are to have the rank of major, then should the office of brigade surgeon, if we are to have such, carry the rank of lieutenant-colonel, and that of division surgeon the rank of colonel.

The Russians recognized that there must be a difference in the rank of their army physicians, and they gave them a definite standing toward each other, though they had no such toward the rest of the army. Moreover they selected men for office irrespective of chin grade and gave them the equivalent of local rank.

The physicians in every country must be reckoned with; they can not be ignored, for no army can be without them, especially in these days. What nation would to-day dare to send its soldiers into the field without a sanitary department, even if it could get them to go under such circumstances? And there can be no sanitary department without physicians, no matter how many combatant officers are thrust therein.

The immense importance that Russia finally attached to her sanitary department and the sacrifices she made to have it properly administered—for her combatant officers were confessedly needed with the troops—should teach us the necessity of magnifying our administrative sanitary officers—for we really need them quite as much as any other—for this is a humanitarian age and the people will demand for their soldiers the best that science can give.

Russia has done much to train physicians for her army—her medical school is an enduring witness to this—but thus far she has done little or nothing to train medical officers. A year's service in the ranks as prerequisite to admission as a candidate for the medical department is now being considered. We might well imitate her in the organization of a school for the education of medical cadets, but we should not stop with the completion of the curriculum of the medical school. West Point is no longer considered the ultima thule of military education, but only the beginning. We have to-day post-graduate courses for all military branches of the service. Are they necessary? If they are, then some like course in medico-military instruction is necessary for the Medical Department. In these days of correspondence schools it would not be difficult to devise some scheme of instruction. Indeed, such was actually carried out by General Woodhull of our corps ten years ago, but was asphyxiated.

The medical supplies were apparently ample, and surgical equipment up-to-date. The interior economy of the hospitals was good. I saw very few military hospitals that were not well kept, even under difficult circumstances, a fact due to a sufficient personnel and probably because of no stress.

There was nothing in the way of equipment except the field kitchen that I thought would strengthen our armamentarium.

EVACUATION OF NONEFFECTIVES.

The "methodical disposition of the sick and wounded so as to assure the retention of those effective on the field of battle, and to relieve the fighting force of the noneffective" laid down in our field-service regulations as part of the duty of the Medical Department in war, is the raison d'être of one of the most important divisions of the Russian sanitary department, viz, evacuation. The ramifications of this organization extend from the division hospital into the very homes of the people, covering en route all sorts and conditions of medical institutions. It is the most important military feature of the sanitary department, as through it the army is relieved of the demoralizing and dangerous burden of the ill and injured.

The regulations governing the disposition of the Russian military invalid are most explicit, and so far as my observation went were well executed. But it must be remembered that I did not reach Manchuria until sixteen months after the war began, and during the period of my sojourn there was no great battle, so that beyond the current requirements in the daily movements of sickness there was no demand made which should not have been easily handled by the organization. I have heard it said that on the actual field, especially in the earlier battles, the wounded were not removed as quickly as might have been done. A report to the Emperor, dated April 15, 1905, reads:

> Altogether up to Baikal there are, including all army medical institutions, more than 80,000 beds, of which at the present time not more than 20,000 are occupied. At Harbin, the intermediate evacuation point, there are 35,500 beds, 6,000 belonging to the Red Cross, of which 32,000 are unoccupied. The rapid evacuation of all the wounded was carried out without special effort owing to the large number of sanitary railroad trains, 60 of which constantly ran to and fro between the theater of operations and Irkutsk. Of these trains 22 were equipped by the Red Cross.

The report continues:

> Having arrived at the very time when the work of evacuation of sick and wounded after Mukden was at its height, I saw how, thanks

to the measures based on the experience of the battles of Liaoyang and Sha River, this last evacuation was carried out in excellent manner.

The general management of the evacuation at the front, as prescribed in regulations, is under the inspector-general of the army, and within the Empire under the general staff. I understand, however, that the execution of the evacuation in the Far East was placed under the chief of the sanitary department, who controlled the body especially charged with this duty. This is known as the evacuation commission.

The regulation reads: "For the purpose of determining the questions concerning the distribution of the sick, according to the kind of disease, and supplying the necessary means of transportation, a special commission is organized at the general staff, consisting of representatives from the transport and medical departments." I take it that the function of this commission in the general staff is the preparation of the policy and general plans of evacuation of the sick and wounded rather than their execution, though within the Empire the responsibility centers in the general staff.

To facilitate the work of removing the ill and injured, the theater of operations is divided into as many evacuating regions as the situation demands, those of the first line being called front regions and those of the second line rear regions.

For each of these there are organized a front, a rear, and an interior evacuation commission, and with the former there is always established a collecting point or transit hospital for the reception, temporary care, and distribution of the sick. Like stations may also be established in connection with the interior evacuation commissions if necessary, but such is not usually the case.

To still further facilitate the transportation, distribution, and supervision of the invalids, state and district evacuation committees are established. These committees are appointed by the governors of the respective states, and are under their supervision, but receive their instructions from the evacuation commission or general staff.

The course of the evacuation may be outlined as follows: The inspector-general of the army indicates to the front and rear evacuation commissions the general direction of the evacuation and the basis of distribution of the ill and injured and assigns to them the necessary personnel, matériel and transport. The general staff instructs the interior evacuation commission, which receives its personnel, etc., from the military administration where it operates.

The inspector-general, or general staff, according to jurisdiction, determines the location of the respective commissions, the place being so situated that all the invalids evacuated into the region of a commission shall actually pass its scrutiny.

While I was in the Far East the front evacuation commission was stationed at Kungchuling with a substation at crossing 84. At the latter was received the sick of the Second and part of the Third Armies, who were sent thence to Kungchuling by rail, while the invalids of the First and most of the Third Armies came directly to Kungchuling. You will recall that the headquarters of the armies were located here, though the commander in chief was quartered some 15 miles in advance, at Gotsaidan. All patients from station 84 were loaded on hospital trains and were passed through Kungchuling, where some were transferred to hospitals there, but the larger number were sent to the institutions of the rear jurisdiction.

At Harbin, 175 miles back of the lines, were located the headquarters of the army of the rear and the evacuation commission of that region, though, indeed, the latter's functions were more those of the front than of the rear. The Harbin commission received all the injured and ill sent to it from the front evacuating regions, including the pre-Amur district. Here were located an immense receiving point with ample hospital accommodations, a great railroad yard, and everything necessary for the receipt, rest, and redistribution of thousands of patients.

In Harbin alone there was hospital accommodation for nearly 40,000 patients, and it will be recalled that over 300,000 sick passed through the Harbin evacuation commission.

The rear commission is charged not only with the distribution of the sick within its region, but it also determines the clearing out of the hospitals there, for which purpose it is required to indicate to these institutions the basis of redistribution of the different classes of cases, together with its extent and the order of evacuation.

From Harbin westward stretches the broad continent of Asia, with Russia 5,000 miles away. The entire region to Lake Baikal was under the jurisdiction of the commander in chief, and from Harbin to that point the medical institutions pertained to the rear evacuation commission.

From the lake westward a new military jurisdiction, that of the étape, appears, and at Irkutsk was established an intermediate evacuation commission, whose jurisdiction extended westward to Chiliabinsk, with hospital accommodations for some twenty-odd thousand patients.

The location of the interior evacuating commission, properly so called, is at Moscow, and through it have passed 100,000 patients from Manchuria. The function of this latter commission is the distribution of the invalids to the military medical institutions under its own control, thence through the state and district committees to the civil hospitals of the country, and even into the very homes of the people themselves.

It must be borne in mind that though the state and district evacuation committees are appointed by the civil governors they are subject to the directions of the evacuation commission and are under the orders of the general staff.

The personnel of an evacuation commission consists of a president, not below the rank of colonel; a vice-president, usually lieutenant-colonel; a chief physician; an officer representing the transportation department; the commandant of the étape station where the commission is located, and a representative of the Red Cross. The interior commissions may have in addition such persons, civil or military, as might be found useful in their work.

As previously stated, all of the personnel are subject to the orders of the chief of the sanitary service, otherwise known as the inspector of hospitals, whom it is presumed takes his orders from the general in chief when in the theater of operations or from the general staff when in the rear.

The regulations are quite specific as to the duties of the president of the commission, who is the executive head, not figurehead, of this important organization. He assigns the various members to specific duties and is himself responsible for the entire work of his commission. His relation to the Red Cross is rather advisory than mandatory. He indicates to the representative of this institution, after receiving information from him concerning the means at his disposal, when and how they might be applied. He has, however, no right to demand that the Red Cross so apply them, neither has he any right to interfere with the internal affairs of the society nor its expenditures.

It is the president's duty to accomplish the evacuation of the sick as rapidly as possible, for which purpose he is authorized to apply, when necessary, directly to the proper authority for any additional means he needs. He is required to make such periodical reports to the chief of the sanitary service (inspector of hospitals) as may be prescribed by the inspector-general. He is responsible that the collecting station hospital is adequate, properly equipped, and supplied, and that the invalids who come under his jurisdiction have shelter, food, medical attendance, medicine, and proper care. He must see that the transportation facilities are adequate and efficient; that the invalids are properly assorted; that they are supplied with linen and clothing; that they are duly paid, and that while en route they have proper attendance. The president has the disciplinary and administrative powers of a local commandant of hospitals and is authorized to permit the expenditure of 1,000 rubles at one time upon the construction of the necessary fittings in the buildings of the collecting stations, etc. He is kept informed as to the number of free beds in the region of his commission and the various places available for the distribution of the sick, and his orders regarding such distribution and further evacuation must be obeyed.

The vice-president when acting as such is directly in charge of hospital and other stores.

The principal physician is the director of the medical personnel on duty at the hospitals of the collecting station as well as with the sanitary transport of all kinds, including hospital trains. He supervises the separation of the sick according to disease, and sees that those transferred are supplied with everything necessary during the time of travel. The medical supplies of the station are under his jurisdiction. From the very nature of the duty the chief physician is the controlling factor in the work of evacuation.

The duties of the other members of the commission are easy to appreciate. The representative of the department of roads and communications is the organ of the commission in matters relating to transportation. Under the direction of the president he looks after the assignment of trains, the outfitting of cars and boats, the meeting of trains, etc.

The military commander of the station is required to keep the commission informed as to the military transport arriving within his jurisdiction, which on the return trip may be available for temporary use in evacuating the sick. He is also required to cooperate in collecting in the region of his command the necessary personnel and matériel required in the evacuation, such as laborers, carts, etc., and he must also detail the necessary guard and escorts.

The representative of the Red Cross cooperates with the commission, under the advice of its president. I find in looking over the regulations of the Red Cross in the Far East that this organization took a very active part in the evacuation of the sick. It had a supervisor of evacuation, who was required to inform himself regarding every sanitary train that left the region of the active army and to see that it was equipped with everything necessary, both as to personnel and matériel, for the proper care of the invalids, viz, medicines, surgical dressings, bed and wearing linen, food, and, if necessary, medical personnel. The regulation proceeds:

> To enable the supervisor of evacuation to carry out his duties, special assistants subordinate to him will be nominated (after consultation between him and the director of the Red Cross) for duty with every evacuation commission, both in the field and on the lines of communication.

The importance of the work was appreciated, and it was safeguarded in all possible directions.

The office of the evacuating commission is in immediate charge of a secretary appointed by the president and confirmed by the chief of the sanitary service.

The foregoing may be regarded as a general description of the machinery by which the Russians "relieve the fighting force of the noneffective." As previously stated, the regulations are minutely specific, and though in detail perhaps not applicable to our service, still the principles of evacuation of the noneffective, like those of strategy, are immutable, and I believe the application of these principles to our service must be made in some appropriate form and definitely prescribed in our field service regulations if the best results are to follow.

THE VETERINARY CORPS.

The veterinary corps of the Russian army is organized on the lines of the medical corps, of which department it was until recently a part, but is now independent. The veterinarian is educated in his profession, and, so far as I could see, had about the standing in the army as the physician with whom he took rank in the "civil grade."

During peace times there are veterinary personnel and matériel (hospitals) with mounted units as follows:

Cavalry and cossack regiments, detached squadrons or sotnias, and cadres of the cavalry reserve; artillery brigades and mortar regiments, horse artillery, and cossack batteries; train battalions.

The veterinary hospitals receive all public animals and the private mounts of officers, for all of which forage is authorized. The regulations are quite specific as to the interior economy of veterinary hospitals. They require that such shall consist of three subdivisions—(1) for convalescents or slightly sick, (2) for seriously sick, and (3) for infectious diseases (quarantine). The duties of the veterinary surgeon are prescribed in detail in the veterinary regulations.

In war sick horses are treated in veterinary organizations at the front, in the train, and at the depots. The veterinary hospitals of the first two categories follow their respective organizations, and are designated by their names, those of the third are assigned for the care of the reserve horses and the animals attached to corps, and are designated by numbers. The first named, being with troops, are practically always organized; the list of such is given above. The veterinary hospitals of the second category are for the trains of the infantry, rifle and reserve divisions, cavalry and cossack divisions, pontoon divisions, and military transport. The hospitals of the third category are assigned one to each corps. These may be supplemented in case of necessity by additional veterinary hospitals assigned to separate horse reserves or to fortresses.

Veterinary hospitals for the division trains are established by the division commander, for the pontoon battalions by the corps or detachment commander, and for the transport by the chief of communications.

The hospitals with the horse reserves are under the supervision of the chief veterinary surgeon of the military zone, those with the corps are under the corps chief veterinarian.

The personnel of a depot veterinary hospital and the money allowance of the same are as follows:

Officials.	Number.	Yearly allowances.				Class of office.	Class of allowances.
		Pay.		Table money.			
		Original.	Increase.	Original.	Increase.		
		Rubles.	*Rubles.*	*Rubles.*	*Rubles.*		
Superintendent of hospital......	1	420.00-387.00	630.00-582.00	600.00	553.00	8	Vet. 2
Assistant veterinarian..........	1	360.00-333.00	540.00-498.00	300.00	276.00	9	Vet. 3
Senior feldsher...	1	34.28- 33.60	66.12- 64.80	....	....	....	
Junior feldsher...	3	25.87- 25.35	49.90- 48.90	....	....	....	
Sergeant clerk....	1	24.49- 24.00	36.73- 36.00	....	....	....	

The staff of a veterinary hospital is based on the requirements of 100 patients.

Military veterinarians have the same rights as military physicians, with corresponding allowances for quarters, subsistence, and servants. Feldshers and sergeants receive clothing and subsistence in addition to the above.

The senior veterinarian of the depot is in command of it and is charged with its administration. He is accountable for the public property pertaining to the hospital, including the public funds for subsistence of personnel and patients, and of all records. He is responsible for the discipline of the personnel and is authorized to issue orders thereto, which are entered in the hospital order book. He has the rights of a regimental commander in administering his command.

Veterinary hospitals in the theater of operations receive their supplies of medicines, surgical instruments, and dressings, etc., from field veterinary dispensaries and temporary supply depots.

The following schedule indicates the diseases for which horses should be admitted to hospital in war time. I might state here that in battle regular veterinary first-aid stations are established in the different organizations.

Cause of admission to train veterinary hospital: Severe wounds, sore backs or shoulders, lameness from diseased feet, etc., varicocele, severe diseases of the eye, and exhaustion requiring rest and nourishment. The depot hospitals receive cases of like character.

Destruction is ordered in the following conditions: Glanders, madness, complicated wounds, fractures, paralysis, wounds of joints, etc., in which the cost of cure is likely to exceed the value of the animal, complicated sprains, hoof rot.

The following is the form of register used in veterinary hospitals:

Name and duties of horse.	Organization.	Disease.	Admitted.	Discharged.	Recovered.	Died.	Incurable wounds.	Incurable disease.	Glanders.
				Transferred to other hospital.					

Month and day of admission and discharge of each horse is entered in column "recovered," "transferred," or "died."

Animals admitted to a train hospital may be accounted for on the forage requisition of the divisional train, or on that of the organization where the hospital is located, but their subsistence is independent of the hospital as a special detachment. Professional reports are rendered to the chief veterinarian.

Commanders of organizations at the front are required to evacuate to train or depot hospitals all animals that can not be treated with the command. Such animals must be supplied with halters, nosebags, brushes, currycombs, and blankets, and be accompanied by a certified ration return. When recovered the animals are returned to their commands with a like certified ration return. When it is impracticable to return the horse to his command he is turned into the nearest horse depot or other organization as may be directed. All veterinary hospitals are subject to inspection by field army veterinary inspectors.

The foregoing somewhat desultory account will at least indicate that Russia has given considerable attention to organization for the care of the animals of her armies in the Far East, and I will now endeavor to show something of what has been accomplished by the veterinary department.

The following is based upon a statement made by the chief veterinary inspector of the Army of the Rear, Doctor Dorbrotvorsky, civil counselor. Doctor Dorbrotvorsky was impressed with the fact that the problems for solution by the veterinary department in the Far East were, mutatis mutandis, quite as difficult as those of the other branches of the service. The long journey across Asia subjected the horses to constant exposure—to anthrax, which is enzootic in that region. This disease manifests itself among the Russian horses in the intestinal form, caught from food or stable litter, with a mortality of from 50 to 80 per cent, and there was every reason to expect a possible epizootic, and certainly a considerable loss from this infection. Preventive inoculations of antitoxin, introduced by Professor Langsh, of Kasan, Russia, were used with the most satisfactory results. Doctor Dorbrotvorsky reports that this invaluable remedy can be used at any time or place without interfering with the use of the animal, and it is undoubtedly due to Langsh's serum that the army horses escaped an epizootic of anthrax. Glanders is universal in Manchuria, but was so effectively controlled by sanitary measures, constant inspection, immediate isolation, and destruction in declared cases that the actual loss was less than 1 in 1,000. Surra did not appear among the Russian animals. In this connection it is stated that the forage obtained in Manchuria—corn, oats, barley, kaoliang beans, bean cake, shu-mi-tzü (hill rice) straw, and even kaoliang stalks—caused no disease worse than an occasional attack of mycotic inflammation of the digestive tract.

Rinderpest is epizootic in Manchuria. This very infectious disease, which ordinarily is only eliminated by destruction of the infected animals, was satisfactorily controlled by the use of antipest toxin, prepared at the Chetinska and Iro antitoxin stations near Troits Kosavaska. This remedy, Doctor Dorbrotvorsky reports, not only prevented but actually cured the disease, and rendered unnecessary the destruction of cattle which would have ordinarily been demanded in 66 per cent of all the animals received. Where used as a preventive, the antitoxin does not produce the disease in modified form. Doctor Dorbrotvorsky reports that "antipest toxin made it possible to feed the Russian army with fresh meat, and without it we would have been compelled to rely upon tinned meat, which contingency was considered in connection with our having to purchase our meat supply in America. This war has settled beyond question the fact that we will not have to depend upon tinned meats so long as cattle on the hoof are available and have been immunized by antipest toxin." Besides rinderpest, there are no cattle diseases of importance. Aphthæ, pleuro-pneumonia, etc., are little to be feared.

I regret that it was impossible to obtain the full morbidity and mortality statistics of animals used by the Russian armies in the Far East. I addressed a letter to the chief veterinary inspector in the field, but received no reply thereto. The statistics of the Rear, furnished from the Harbin office, are as follows:

Horses received from Russia, including Siberia, January 1, 1904, to August 1, 1905, 225,819, and exclusive of 542 sick; horned cattle from Siberia, 150,419; horned cattle dead from rinderpest, 10,000; sheep passed through Harbin, 100,611.

There is a very careful system of inspection. There are two veterinary hospitals at Harbin; the statistics of one are as follows:

Treated in hospital: July, 1905, 133 horses; August, 1905, 123 horses; September 1 to 20, 1905, 113 horses. During this period 267 horses were treated in quarters. The mortality was as follows: Anthrax, 1; glanders, 7; hydrocephalus, 4; apoplexy, 2; lumpy jaw, 4. Among some of the other diseases treated were influenza (epizootic), 60; rhinitis, 23; lumpy jaw, 13; colic, 27.

I find on looking over the notes of an interview with the chief intendant that he stated the wastage of animals had not then been computed. He further said that 150,000 mules had been purchased in Manchuria.

The important lesson for us in the Russian veterinary experience is the successful use of antitoxin sera in the treatment of animal diseases. Nothing is said of tetanus by the veterinarians, from which I infer there was little among the animals in the Far East. I presume there must have been some cases, and a large percentage of these probably died if the veterinary experience was the same as the medical. Russian physicians regard the antitoxin of tetanus as at present made as of little or no value. But with anthrax and rinderpest the results were most satisfactory, and I believe the antipest serum has a present and future value to us which should not be overlooked.

Another lesson we might learn is one of organization. We have no real veterinary department, for a small percentage of veterinarians scattered here and there do not constitute such a department. Do we need such? If so, let us have the best that can be organized and not a mere makeshift.

SPECIAL DISEASES.

It goes without saying that the time for a decisive discussion of the sanitary statistics of the war in Manchuria has not yet arrived. It took a number of years for the statistics of our civil war to crystallize into their present form, and we must expect this to be the case with the statistics of the Russian and Japanese armies in the war of 1904–5. General Kuropatkin himself states that he does not yet know whether he had 275,000 or 290,000 bayonets at Mukden. I find by reference to my notes that on August 11, 1905, the following telegraphic report was sent to the Emperor:

	Officers.	Men.	Total.
Sick	975	24,004	24,979
Wounded	52	1,313	1,365
Grand total			26,344

Of the cases under treatment within the theater of war of that date there were:

	Cases.		Cases.
Typhoid fever	1, 151	Anthrax	[illegible]
Typhus fever	22	Variola	[illegible]
Dysentery	418	Scurvy	[illegible]

From the beginning of the war up to July 14, 1905, there had been under treatment:

	Cases.	Died.
Typhoid fever	10, 449	[illegible]
Typhus fever	201	[illegible]
Relapsing	170	[illegible]
Dysentery	5, 456	[illegible]
Variola	209	[illegible]
Scurvy	1, 180	[illegible]
Measles	11	[illegible]

Report of morbidity of August 14, 1905, handed me by Doctor Gorbacevich September 5, 1905, read as follows:

	Wounded.	Sick.
Officers under treatment	38	[illegible]
Enlisted men	1, 116	[illegible]

The infectious-disease cases on that day were:

Dysentery	677	Anthrax	3
Dysentery, pseudo (?)	181	Erysipelas	71
Gastero enteritis (epidemic)	299	Scurvy	281
Typhoid fever	2, 709	Measles	3
Typhus fever	19	Smallpox	21
Grippe	1, 013	Total	5, 759
Relapsing fever	9		
Malarial fever (intermittent)	473		

This report does not seem to agree with that sent to the Emperor.

MORBIDITY AMONG THE RUSSIANS IN THE FAR EAST.

On September 13, 1905, there were:

	Officers.	Men.	Total.
Sick	1, 024	23, 489	24, 513
Wounded	30	592	[illegible]
Total			25, 135

Of which there were:

	Cases.		Cases.
Typhoid fever	5,287	Anthrax	1
Dysentery	646	Erysipelas	41
Typhus fever	40	Scurvy	104
Grippe	1,089	Smallpox	4
Malaria	559	Measles	4

From the foregoing, it will be seen that the morbidity experience of the Russian armies in the Far East has been different in certain important particulars from that in recent wars. There was, to be sure, typhoid and dysentery in not inconsiderable amount, but malaria cut very little figure, while mumps and measles, which we always look for, practically failed to appear. There was a considerable amount of scurvy, probably much more than is of record, and venereal was of little moment. In fact, the comparatively small number of deaths from disease (18,830) indicates a state of healthfulness unequaled in military history. The question naturally arises as to why this was so, and this I will endeavor to explain.

The Russian peasant who reaches the age of maturity is the survival of the fittest, for the conditions of his life from the beginning are such as only the strongest can endure. Huddled together with the rest of his probably large family in ill-constructed and unventilated habitations, poorly fed and worse clad, the child grows up in an atmosphere of privation, is subjected to all of the diseases of infancy, endures the rigors of a harsh climate, and survives only because of his own intrinsic resisting powers.

Owing to Russia's enormous population, the amount of material available for military purposes is practically unlimited, and from this material she took the best for service in the Far East. Starting in perfect physical trim, the men of the mobilized units traveled slowly for two months across the continent of Asia, under constant observation and frequent critical inspections, so that every man who by any chance might have been suffering from latent infection at the beginning or who developed such infection en route was at once separated from his command. Thus it was that the troops reached the theater of operations free from infection and in good condition to resist the morbific influences they would necessarily be subjected to in active service.

Of the climate of Manchuria little need be said here. That part of the country I saw (Harbin region) reminded me of our own Mississippi Valley in many respects—soil, vegetation, temperature, streams, etc. The summer is comparatively short, and there are many warm days, while the winter is correspondingly long and cold, the mercury lingering around zero and often falling much below it in January and February. In July and August is the rainy season, during which there are at least daily showers and often continuous downpours, the result of which is that the whole country goes into solution. The snowfall is light and does not remain on the ground for any length of time, being blown away by the wind or vaporized by the sun.

I was told that the prevalent diseases among the natives are typhoid fever, dysentery, and smallpox. In 1899 bubonic plague appeared in Niuchwang, but was confined to that region. I heard of but one outbreak of plague within the Russian lines during my sojourn in Manchuria. This occurred at Dgailainov, a station on the railroad not far from the border, September 22, 1905, just before I started for home and seems to have been accepted by the authorities as veritable plague. The disease was apparently confined to one family, eleven of which died. As strict quarantine precautions were at once instituted I presume there was no extension of the infection, though I left the country before this could be determined. In 1902 a quite severe epidemic of cholera began at Vladivostok and reached westward to Harbin, but no cases of the disease were reported while I was in the Far East.

It is important to add that there are but few mosquitoes, and those I saw belong to the Culex family. During the rainy season the common house fly swarmed in countless numbers, and I was forced to protect myself from their nightly attacks by using my mosquito bar.

The conditions of the campaign in Manchuria until after the battle of Mukden (March, 1905) were such as to demand frequent changes of camping grounds, there being at least one battle monthly, so that before Mukden the army was not exposed to great danger from soil pollution. During the Russian occupation of Mukden, and subsequent thereto, until June, 1905, the troops were quartered in "dugouts."

The army ration is adequate and well balanced, but much of the time all its components were not obtainable. During the winter I am told that vegetables were scarce and the dietary was largely meat, bread, and tea.

The Russian food habits and method of cooking are ideal, from a military standpoint. Everything except the bread is boiled, and is thus not only thoroughly sterilized, but is placed in the best possible condition for assimilation. Moreover, the universal use of soup and tea reduces the demand for raw water to a minimum and largely eliminates the probability of infection from this source. The Russians, though constantly driven back, were not demoralized. Attacked furiously and persistently by overwhelming numbers, this army was never captured and was always ready to fight, though not until the last so well prepared as was its adversary. So the moral effects of persistent defeat cut little or no figure in the mortality bills.

From the foregoing outline of sanitary conditions obtaining among the Russian forces it would have been easily possible to predict what the sanitary results must be.

Typhoid and bacillary dysentery were endemic in Manchuria, and these diseases were bound to appear in the army with greater or less virulency, even though the troops arrived in perfect health and as a rule lived rationally. I say "bound," because these infections were widespread, and under the conditions of military life could not be wholly avoided. The question for us is, Was the best done that the conditions permitted?

In attempting to answer this I will briefly consider the etiology, prognosis, and results of some of the diseases specified, especially of typhoid fever and dysentery.

I think that in the light of present experience we are justified in believing that certain factors of dissemination of typhoid infection cut a much larger figure in camp typhoid than in house typhoid. Based upon the report of a board appointed to investigate the typhoid epidemic in our camps of mobilization in 1898, there seems little doubt that flies and personal contact were the important factors in spreading the germs, while water was secondary or even negligible. The conclusion, which was certainly revolutionary, and which I think is largely justified by the evidence, is accepted by us more freely than abroad, where fly and personal contact are not so seriously regarded.

In discussing the causes of typhoid in the Russian camps Doctor Gorbacevich, chief medical inspector, stated his opinion to me as follows:

First. The fouling of the surface of the ground by infected excrements.

Second. Constant employment of men in the trenches. (Soiling with earth and exhaustion.)

Third. Impossibility of personal cleanliness in camp during the rainy season, which is the typhoid season among the natives.

Fourth. Crowded state of the military population in camp and the unaccustomed conditions of military life.

Fifth. The infection of drinking water by surface washing, especially during the rainy season.

Doctor Gorbacevich stated as his opinion that flies had nothing to do with the spread of typhoid fever in the armies of the Far East, though they were an important factor in spreading dysentery and anthrax.

He said that typhoid fever is epidemic in Russia during cool weather, reaching its maximum in October and November, and thereafter diminishing until February, when it disappears. This is the rainy season in southern Russia, but there are no flies. In northern Russia the epidemic disappears with the coming of snow. All the Russian physicians with whom I conversed on this subject agreed with the views expressed by Doctor Gorbacevich.

Nothing is more certain than that typhoid fever is a water-borne disease, and I think that we are perfectly justified in believing that infected water is the chief cause of typhoid fever in house dwellers, for they have no open sinks and flies are excluded. But with the tent dwellers the conditions are different, for in military camps the population is dense, the sinks open, personal cleanliness and camp police often indifferent, infection almost always present, and during the beginning of the typhoid season flies always abundant. Here the man and the fly are the disseminators of typhoid.

Before considering several of the facts regarding typhoid fever as seen in Manchuria, I will briefly state what seems to be the accepted views of the medical profession on the rôle of the fly in disseminating the bacillus typhosis. The report above referred to of the board on typhoid fever in our camps of mobilization, 1898, of which disease the board states that there were over 20,000[a] cases and a mortality of 7 per cent, indicates that water played an unimportant part, but that the infection was carried by flies, dust, and personal contact. At Chickamauga I saw kitchens and latrines "cheek by jowl" in numerous cases. I saw flies breeding by millions in the latrines and horse manure heaps at hand. Then, too, because of the inadequacy of the Hospital Corps, we were forced to call upon the line for details to assist in the hospital work, thus inviting further spread through personal contact, and our recommendations that infected commands be isolated were ignored until all became infected. This was universally the case; there was proportionately no more typhoid at Chickamauga than in the other camps. All were equally infected, and the only redeeming feature about the situation was that the mortality was so comparatively small. The sanitation of our camps was execrable, but the professional work of the medical corps was remarkably successful, for it saved all but 7 per cent of its cases, while 10 per cent died in Manchuria, and this is the average loss even under the best conditions.

Returning to the causes of camp infection, Veeder asserts his belief that flies are the chief factor in transmitting infection during the autumn, the period of most pronounced activity of the disease, a conclusion reached during an investigation to determine the origin of a local epidemic. Interesting experiments were instituted by Ficker to determine if flies could be infected by feeding on typhoid cultures, how the bacilli acted within the insects, if flies could transmit the infection to human beings, and, if so, for how long a period. The conclusions reached were that the common house fly could eat the typhoid bacillus without danger to itself and that it could transmit the infection for a period of twenty-three days. The bacilli were found in the head, wings, and legs on the fifth day and in the intestines on the ninth day after the ingestion of the infected material.

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[a] The German army had over 73,000 cases of typhoid fever during the year of the Franco-Prussian war.

That personal contact cuts a considerable figure in the transmission of typhoid fever is shown by the investigations of Tolayvoch, who reports that between 1881–1899 6.3 per cent of the cases of typhoid fever occurring in the German army were hospital infection.

It must not be inferred from the foregoing that I am inclined to disregard the importance of water as a cause of typhoid infection. This has long passed the period of surmise and has become universally accepted. Certainly in the light of experience no military sanitarian can ignore the pernicious effects of the average raw water. Indeed, I have contended that the use of boiled water should be as much a part of military routine as the use of boiled potatoes or any cooked food. In campaign our only safety lies in regarding all water as infected. This involves the training of our soldiers to use boiled water at all times and the constant employment of some sterilizing apparatus, with a personnel to properly care for it. The extra work and cost involved would be amply repaid by the decreased noneffectiveness from water-borne diseases.

I believe the campaign in the Far East fully sustains the position heretofore taken by military sanitarians regarding camp typhoid, and it certainly shows how difficult it is to exclude this disease, no matter how favorable the conditions may be.

It has already been shown that the Russian soldier reached the theater of war free from infection, and that he campaigned in a country where typhoid fever is endemic. Let us now consider the movement of this disease during the war.

By reference to the table showing the movement of sickness from the beginning to July 1, 1905, it will be seen that 10,449 cases of typhoid fever had come on sick report, of which 1,041 died in Manchuria.

I learn that on July 18, 1904, there were 100 cases in hospital, of which 50 came from the front; October 26, 1904, 4,350 cases, of which 3,700 came from the front, and on December 31, 1904, 900 cases, of which 800 came from the front.

From January 1 to July 1, 1905, there was a daily average of 175 cases of typhoid fever on sick report. July 15, 1905, there were 800 cases; July 23, 1,500 cases; August 1, 2,400 cases; August 15, 3,500 cases; August 23, 4,400 cases; September 1, 5,287 cases.

I am indebted to Doctor Gorbacevich for the following table:

Movement of typhoid fever during August and September, 1905 (including last week in July).

	Fourth week in July.		First week in August.		Second week in August.		Third week in August.	
	Rate per 1,000, all diseases.[a]	Actual number of cases of typhoid taken sick.	Rate per 1,000, all diseases.[a]	Actual number of cases of typhoid taken sick.	Rate per 1,000, all diseases.[a]	Actual number of cases of typhoid taken sick.	Rate per 1,000, all diseases.[a]	Actual number of cases of typhoid taken sick.
First army	....	234[*]	34.7	180	22.2	167	17.4	199
Second army	....	394	39.0	254	35.5	285	26.5	193
Third army	....	166	29.9	66	34.0	157	27.9	86
Rear army	....	166	....	123	....	354	....	227
Pre-Amur district	....	19	....	20	....	109	....	51
Total	....	679	....	643	....	1,072	....	756

	Fourth week in August.		First week in September.		Second week in September.	
	Rate per 1,000, all diseases.[a]	Actual number of cases of typhoid taken sick.	Rate per 1,000, all diseases.[a]	Actual number of cases of typhoid taken sick.	Rate per 1,000, all diseases.[a]	Actual number of cases of typhoid taken sick.
First army	19.2	256	....	193	....	82
Second army	31.7	148	....	132	....	97
Third army	20.8	132	....	73	....	64
Rear army	....	103	....	70	....	55
Pre-Amur district	....	54	....	36	....	40
Total	....	693	....	504	....	338

[*] Of the cases under treatment 9.1 per 1,000 were in hospital.

The rate is based on the strength of the respective armies.
By reference to page 118 it will be seen that the three field armies had a combined strength of 729,000.

On September 16, 1905, the total number of cases of typhoid fever under treatment was 5.898.

Information received from another source was as follows:

	July.		August.	
	Officers.	Men.	Officers.	Men.
Taken sick	136	2,662	149	[illegible]
Died	3	359	[illegible]	[illegible]

From the beginning of the war to September 1, 1905. there were 17,033 cases of typhoid, of which 2,077 died.

It will be observed that there are considerable discrepancies between the statements of the different authorities as to statistics. Such must be expected and averaged. Statistics take a long time to crystallize and during the process are constantly changing, though always pointing in the direction of the final permanent form.

It will also be observed that there was a steady decrease in the number of cases from the middle of August, which it is reasonable to assume will continue until normal endemicity is reached. This decrease was undoubtedly due to the stricter enforcement of sanitary orders, the observance of which had been considerably relaxed. The best evidence of the good results following such enforcement is obtained from our own experience in the Spanish-American war, in which typhoid was reduced from 5 per cent in September to a fraction of 1 per cent in December, 1898.

It might be well to here consider some of the individual and collective habits of the Russian soldier man as causative factors in the dissemination of typhoid infection.

I have heretofore stated that the preparation of the ration is ideal from a sanitary standpoint, the food reaching the soldier hot, diluted, and with every bit of its nourishment in the best condition for easy assimilation. His favorite beverage, tea, demands the ingestion of a large amount of hot, sterile, and stimulating liquids. His bread is a more likely source of infection, but being made from a flour containing all the elements of grain it permits peristaltic action and keeps the digestion regular. I look with suspicion on the bread as an inviter of flies and of hand-and-mouth infection.

This possibility seems to have impressed itself upon the Russian physicians, for I observed in the venereal ward of the naval hospital at Vladivostok that every patient was required to keep his ration of bread in an individual bag hung at the head of his bunk and was not permitted to expose it except at meal time. Here is a note I made August 25, 1905, at the étape eating station, Kungchuling:

> Contiguous to the bakery are a number of kitchens, and in the open air many tables at which the men were standing, eating their rations in apparent content. I watched the process with interest. On the table in front of a squad were a dish of soup and one of cassia (buckwheat), and scattered around at convenient points hunks of black bread. Each man was provided with a wooden spoon (individual) about the size of a large tablespoon, which he dipped indiscriminately into the soup, the cassia, and his mouth; chunks of meat carved with a jacknife were eaten from the hand. I did not observe many flies about the table this morning, but on other occasions have seen them swarming on the food, the tables, the men, and everything in the neighborhood, including the sinks. The possibilities in the spread of typhoid under such conditions are great, especially when the sink habits of the men are considered.

I think that this war has demonstrated, what is now accepted by us, " that flies are, under active-service conditions, one of the most important disseminators of the typhoid germ, and that soiled hands cut no small figure."

It will be recalled that the troops had been in the same camps from shortly after Mukden. Until May they had burrowed in the ground and thereafter had gone under canvas. The camps soon assumed a state of permanency and were generally well kept to outward appearance. The Russian soldier's tent is square, with a nearly flat or gently sloping roof. Its dimensions are, height, to peak 7 feet 8 inches, to eaves 5 feet 2 inches. The walls actually measure 6 feet, but with the slope the tent is but about 5 feet high at the eaves. Its area is 12 by 12 feet, and its maximum occupancy 20 men. The tent is pitched on a center pole, and inside at each corner is a corner pole. Ropes sewed into the canvas of the roof run from the center to the corners. The length of the center pole, which is jointed, is 7 feet 8 inches, and of the corner poles 5 feet 2 inches. There is a long guy rope at each corner which is secured to a large tent pin 3 feet long and 3 inches in diameter. The walls and the roof are separate, the former being suspended from the latter, the spaces between them serving for ventilation. This is covered by a flap sewed to the roof. The material is light (probably 10 ounces) flat duck. The door is at the point where the ends of the wall meet. The shelter tent was much in evidence; in fact, it was almost universal at the front. This tent is much like our own, but instead of being pitched for 2, I observed that a squad of 6 usually combined their shelter halves.

The most comfortable arrangement I saw was a camp in which the tents were pitched on a turf wall 2½ feet high. Within on either side was a platform of boards separated by a narrow passageway. The platform and aisle were covered with Chinese matting, and the tents presented a very neat appearance.

This plan of fixed walls was quite generally followed, even when shelter tents were used, and there was always an attempt made to get the men off the ground level, even if nothing but an earthen platform was available. I observed many tents with wickerwork walls, which certainly promoted ventilation.

Some of the tents were so badly worn that per se they no longer afforded shelter, and all sorts of material, chiefly mud, were used to patch them up.

Of course everything that tended to permanently fix the tent prevented its frequent removal to another site and the aeration of the occupied ground, so necessary to the healthfulness of the tent dwellers.

The Russian camp latrine or sink is quite different from those used in other armies, and opens wide its hospitable arms during the typhoid season to the swarms of visiting flies.

I am informed that before the large increase in the number of typhoid cases very little attention was paid to the regulation which required the construction and use of camp latrines, the soldier preferring a neighboring copse or swale to the uninviting latrine, and I remember to have seen scarcely any vessels for night urination. I find in a note made at Kungchuling, July 28, 1905, the following: "So far as I have observed in going about here, there is very little conservancy of pits and sinks." Later there was a thorough house cleaning, but this did not occur until after the typhoid epidemic had become established. The police of the camp grounds was usually excellent when such was at all practicable, but with mud a foot deep police of place or person was impossible, and the soil and the men became mutually toxic. The sink habits of the men regarding personal cleansing I believe cut some figure in disseminating typhoid germs. Paper was scarce in Manchuria. At best, newspapers are not very plentiful among the Russians, and the men had nothing to wipe themselves with except leaves or grass, and not always these; so the cleansing was done, if done at all, with the fingers, which in turn were wiped off on the most convenient thing, as there was nothing else to do.

Deep wells (60 to 80 feet) were dug for the use of the troops. The standing regulations governing the use of water are quite drastic. They read as follows:

> The drinking of raw water is prohibited, except of spring or well water free from the possibility of infection, which will be determined by physicians after consideration of the sources of the spring and the construction of the well.
>
> Muddy water containing suspended matter not traceable to its source must be clarified, etc.
>
> Water suspected of being pathogenically infected must not only be clarified, but purified by the indicated means.
>
> The responsibility for the adoption of the means devolves upon the surgeons of the units and hospitals.

The rules given are well known, generally accepted, and need not be repeated here, though there might well be a constant reiteration of the following regulation:

> The best method of sterilizing water is by boiling it, and the most practical way to enforce its use is to give it with tea, which should be done whenever possible. All water used by the men for drinking should be boiled, for which purpose proper apparatus should be supplied. Water may be considered safe if boiled for thirty minutes, not counting the time consumed in bringing it to the boiling point. Boiled water should not be kept for more than twenty-four hours and must be kept in clean receptacles, which must be frequently washed, must be supplied with metal faucets, and tightly covered. The taste of boiled water may be improved by adding citric acid.

The wells I saw were supplied with windlass and bucket, and many of them were under guard.

I have already alluded to the food, which will be described more in detail in the chapter devoted to that subject. The preparation of the food has excited the admiration of every one who has seen the Russian method, and as a military proposition this, more than any other feature, demands our careful consideration.

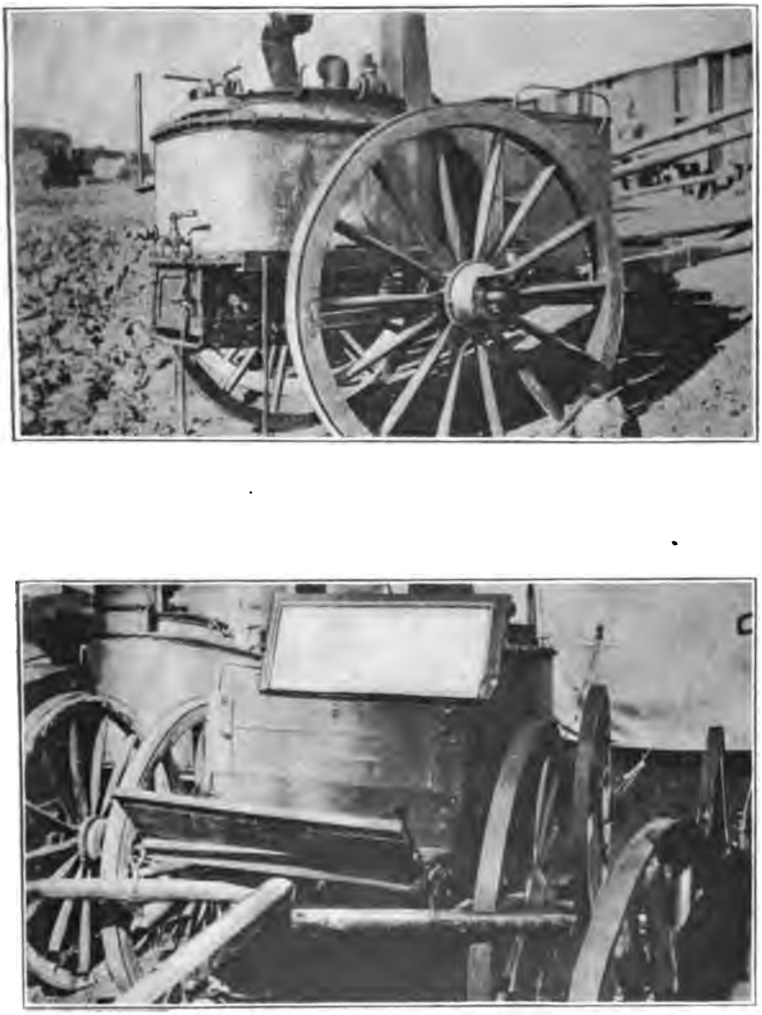
This matter is gone into in extenso in Colonel Havard's report and need not be further elaborated here. I understand that Germany is now carefully considering the question and has offered a prize for the best cooking apparatus for field service, with view to its adoption by the army of the country. There was not an attaché with whom I spoke who did not seem to be impressed with the military importance of the Russian field kitchen, which could be, and actually had been, taken up to the very skirmish line loaded with hot food and drinks for those actually engaged in battle.

The Russian peasant is accustomed to the simple life, and the life of the Russian soldier, itself simple enough, is a promotion to him. I have it from the Emperor's own lips that his soldiers in Manchuria were better fed than his peasants at home.

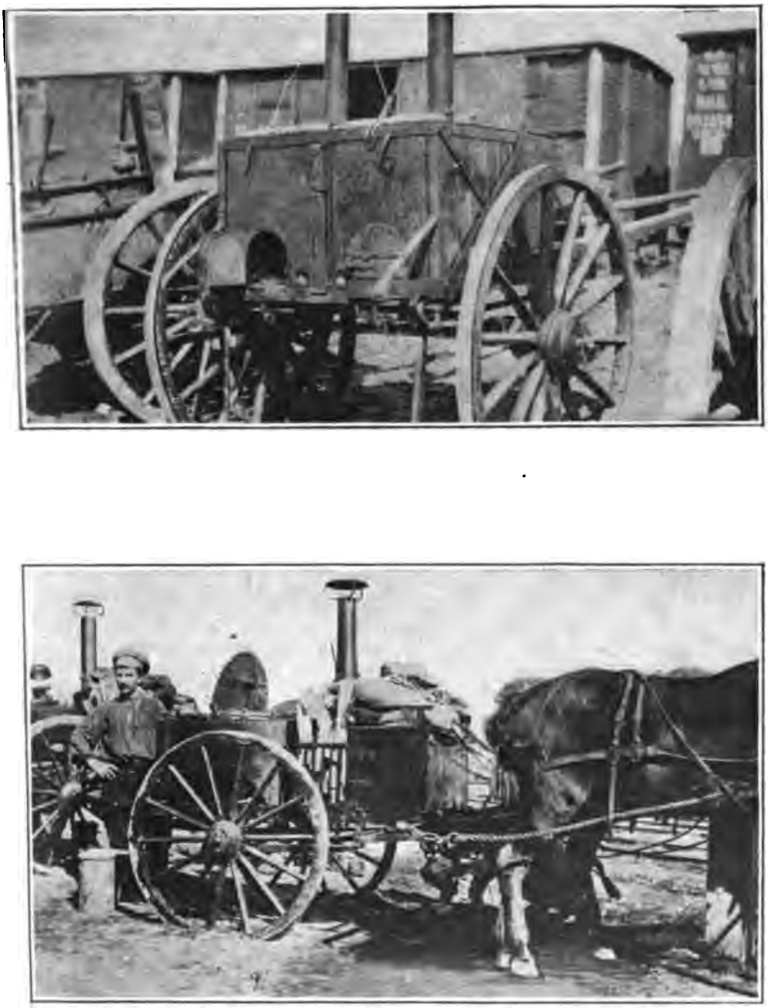
The soldier's material wants are well met, but he has little or nothing with which to obtain other than that his Government gives him.

In the Far East everything was under absolute military control. Nothing could be brought into the country except by military authority, and consequently little or nothing got there in the way of food or drink that could harm the soldier even had he the wherewithal to purchase it. I observed some stores where many necessaries and a few luxuries could be purchased at little more than home prices. These were branches of army cooperative stores in St. Petersburg and Moscow. Cigars and wine in moderation were obtained by officers, but the enlisted man's choice was very limited—tobacco, some sweet crackers, needles, thread, etc. I mention this to show that the Russian soldier was not subjected to the evil influence of the pie and beer vender, not to speak of viler stuff, and his intestinal tract was not thereby rendered inviting to the microbes seeking to destroy him.

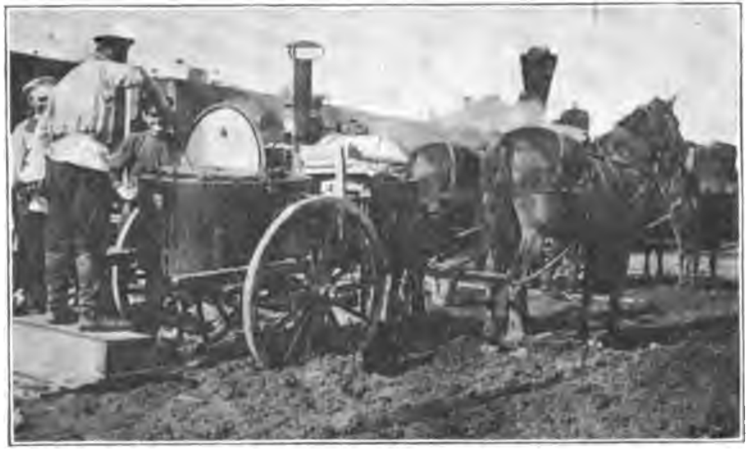
I can not but feel that the Russian authorities placed too much stress on one of a number of causes of typhoid epi-



TYPES OF RUSSIAN AMBULANT FIELD KITCHENS.



TYPES OF RUSSIAN AMBULANT FIELD KITCHENS.



TYPE OF RUSSIAN AMBULANT FIELD KITCHEN.

demic and lost sight of others of equal, indeed, greater, importance in camp typhoid. I am told that the Japanese isolated their cases of typhoid as strictly as those of smallpox, and who can question their wisdom in so doing? I know not what their typhoid statistics may be, but I am very sure that if isolation was strictly practiced the figures will be comparatively insignificant.

I do not think the necessity for isolation was fully appreciated by the Russians. They certainly sent the typhoid cases out of their camps in large numbers, but I was unable to learn of any extraordinary effort having been made to search out and isolate suspected cases, which is an important part of prophylaxis. Let us not forget, however, that the Russians were, at the time this epidemic appeared, thinking more of the enemy in front of them than that in their midst.

The conditions obtaining, in at least some of the hospitals I inspected, strongly impressed me with the opinion that the dangerously infectious character of the disease in its epidemic form was not appreciated by the hospital authorities. I have only a note here and there of cases of hospital infection, but they occur frequently enough to indicate that such was rife.

The chief of the Red Cross at Kungchuling told me that the type of the disease was severer in 1905 than in 1904; that a Red Cross physician and nurse had died during the preceding week, and that several others were critically ill.

I find the following note (August 25, 1905), illustrative of the hospital conditions:

> This afternoon I visited the St. George Red Cross hospital No. 2, where there are 120 typhoid cases under treatment, with two or three deaths daily. The typhoid and other cases are treated in the same wards practically, as broad doorways connect all the wards and the doors are constantly open. The windows are without screens, the beds without bars, and the flies come and go as they list. The dejecta are received into bedpans that contain no disinfectant, are covered with a solution of calcium chloride, and at once thrown into a privy vault, which is the receptacle of all the kitchen and other wastes from the hospital, and which vault is emptied by Chinese labor once weekly. I had a long talk with the head nurse and told her about the dangers of the disease she was treating, regarding which she seemed ignorant, though anxious to learn. The well from which was drawn the water used in the hospital is about 50 feet from the latrine above described.

In this hospital several of the personnel came down with typhoid fever. Apparently no precautions are taken to disinfect linen, dishes, hands, etc.

I later visited military hospital No. 83, contiguous to the above-mentioned Red Cross hospital. Here one of the physicians told me that the dejecta are received into a dry bedpan, are disinfected in the pan, and thereafter placed in a large receptacle filled with disinfectant and there remain for twelve hours. He further told me that all the personnel are required to disinfect the hands after handling patients or infected material, which material was also disinfected. In proof of his statement he showed me his finger nails, which were discolored, presumably by the disinfectant. I did not personally see the above-described routine. In the physician's opinion the hospital well was infected (though this had not been demonstrated bacteriologically), as the latrines were on higher ground and seepage therefrom into the well probable. He added that he had no doubt the whole place was thoroughly infected, as last year (1904) the buildings were occupied by military hospital No. 1, which was used as a typhoid hospital. Ten of the personnel had been taken with the disease, five in one week. I observed that the windows were screened, but the doors were hospitably open to flies and the patients were not protected by bed nets. It was stated that attempts had been made to protect the patients through the use of veils made from gauze, but they threw them off. Upon the whole, I am impressed with the conviction that any effort made in the hospitals to prevent the spread of typhoid infection was, to say the least, inadequate.

A study of the health conditions at Vladivostok are interesting. This fortress, located at the seaport of the same name, is considerably south and east of Harbin, though in eastern Siberia. The port is of some importance and there is a civil population of about 20,000 at present. The strength of the garrison was in 1904, 19,378; in 1905, 66,000, with outlying forces numbering about 35,000 additional.

The movement of sickness was as follows:

	1904.		1905 (to September).	
	Cases.	Deaths.	Cases.	Deaths.
Typhoid fever	132	22	68	4
Scurvy	3	....	425	....
Dysentery	7	....	36	3
Grippe	223	....	422	....
Syphilis	128	....	215	....
Other venereal diseases	342	....	(?)	....
Enteritis	204	....	663	....
Diseases of lungs and throat, acute	417	21	560	6
Accidents and injuries	165	2	321	2
Diseases of the eye	61	....	327	....
Diseases of the skin	533	....	(?)	....
Other diseases	1,754	19	4,070	28
Total	3,970	64	7,107	43

Average strength of commands, not including sailors.

	1904.	1905 (to September).
Officers	378	(?)
Men	19,000	66,000

The water at Vladivostok is bad. There are no waterworks and no sewer system.

During 1904 the following cases were treated in the naval hospital at Vladivostok:

Typhoid fever	3	Pneumonia	19
Malarial fever	11	Insanity	4
Smallpox	1	Tuberculosis	23
Venereal	497	Wounds	151

Among these were 80 deaths. I was not given the statistics for 1905. In passing through the hospital, which was quite the finest fixed hospital I saw during my absence abroad, I saw a number of cases of typhoid fever scattered throughout the various medical wards mixed in with other cases. The surgeon told me that they were convalescents. The cases certainly must have been mild, as the cards indicated not over three weeks in hospital. I was informed that all cases were confirmed by bacteriological tests. The administration of this hospital was otherwise excellent, and yet here were typhoid cases treated alongside of other diseases as though contagion was the last thing to be avoided.

As a practical fact I don't think that the Russians have yet come to realize that camp typhoid fever is a quarantinable disease.

In glancing back over the foregoing somewhat disconnected story one is impressed with the fact that the troops in camp on the lines were the sufferers from typhoid. It can not be said that there was overcrowding such as we had at Chickamauga, for instance. The positions covered a front of more than 50 miles, and while they were occupied by 700,000 men, the camps were not continuous, but the troops were camped by regiment or even battalion. I did not, of course, see all the camps or even a larger part of them, but those I did see were certainly not overcrowded, there was, as a rule, ample space within the unit camps, and ample surrounding space for organizations.

The men went into camp in May after a winter in dugouts, following a series of terriffic battles, and with none too much food; indeed it has already been stated that the scorbutic taint prevailed extensively. The question arises as to whether these were the men attacked by typhoid or were the late comers the victims. So far as I could learn by inquiry of those with whom I could speak the men longest on the ground were those first attacked; but not when they came out of winter quarters and presumably were most debilitated, not during the cold of the spring, but during August, three months later. As Doctor Gorbacevich said, during this time they were working in the trenches, but typhoid remained at its minimum until July, when it began to increase. There were two universal conditions in July which had not before obtained during the year—rain and flies. According to Doctor Botkin, the camp conservancy had not been good and the surface of the ground surrounding the camps, including the camp wells, was probably infected. We know that dejecta were scattered about on the surface, and we also know that there were some typhoid and some bacillary dysentery among the men. There was, however, no marked increase in the average number of dysentery cases. Regarding the use of rain water the regulations seem to be specific enough, but I fancy were difficult to enforce.

The water, some of it, was analyzed, for every medical chief of a corps had a hygienist and laboratory attached to his staff. Besides these, there were three laboratories at Harbin and one at Kungchuling, not counting the Betkin railroad laboratories. The director of the latter told me that he had made thirty water analyses from samples taken about Harbin, as the result of which five wells were condemned and filled up, colon bacilli having been demonstrated. I got no such definite statement from other laboratories. Doctor Shaffer, of the German army, said, so far as he had observed, the soldiers drank when thirsty the water most convenient to get. Moreover, during the warmer weather they drank more than usual. It is a fair presumption that in Manchuria all running water is typhoid infected, as typhoid as endemic there. So much for this possible cause of the typhoid epidemic. It has been heretofore stated that the common house fly made its appearance in July in swarms and continued in swarms until frost came. The sinks were convenient, the fly ubiquitous. How considerable a factor was the fly in this typhoid epidemic? Then, too, during the rainy season the men lived in the mud; they could neither keep themselves, their habitations, nor their camp grounds clean. Were they factors in spreading the epidemic? If the typhoid bacillus was spread by these means, then why not the Shega bacillus?

I quote from my notes of September 13, 1905, made while en route to Vladivostok:

> Speaking of the typhoid epidemic, which is likely to spoil the splendid health record of the Russian army, I am impressed with the belief that the following factors enter into it:
>
> First. The endemicity of the disease in Manchuria and in the army, many cases occurring every month.
>
> Second. The depreciation of the health of the army during the winter in sod houses, the result of which was a marked scorbutic taint.
>
> Third. The long continuance in the same camps.
>
> Fourth. The rainy season, which began July 10 and continued through August.
>
> Fifth. The appearance of flies, which occurred in June.

All of the conditions except the second are identical with those which appeared in our camps during the Spanish-American war. The advantage with the Russians was that they could get no food other than that issued to them and no stimulant other than tea.

The epidemic of typhoid attacked probably 1 per cent of the fighting army, say 7,000, for most of the cases came from the front. Of this probably 12 per cent died, as the infection was more severe in 1905 than in 1904, say 840 men. This is about the same number of cases as reported in Philadelphia in 1904. Can a field army do better? I think so, but there will have to be wider dissemination of a knowledge of the laws of right living before the white man will do it.

I learned nothing new regarding the treatment of typhoid. The same routine of sponging, diet, and watchful care. There were new facilities for tubbing. Soup, always acceptable to the Russian, was the diet, no milk being available, and those who desired it were permitted to eat bread. I heard of no operations for perforation, though frequently asked if such had been done. When I left Manchuria the time had not yet arrived for compiling the detailed statistics of the epidemic, and what is noted here is from the point of view of a hygienist rather than a clinician.

DYSENTERY.

Dysentery has always been recognized as one of the most important causes of noneffectiveness in field armies. It was a veritable scourge to the Russian forces in China during the Boxer uprising. Doctor Gorbacevich told me that the mortality from this disease in that campaign was 16 per cent of the cases, whereas during the present war it is less than 5 per cent. The Union Army lost from dysentery during the civil war 24.77 per thousand, nearly twice the number dead from typhoid fever. Kean, quoting from the medical and surgical history of the war, says:

> These disorders (dysentery and diarrhea) occurred with more frequency and produced more sickness and mortality than any other form of disease. They made their appearance at the very beginning of the war, not infrequently prevailing in new regiments before their organization was complete, and although as a rule comparatively mild at first, were not long in acquiring a formidable character. Soon no army could move without leaving behind it a host of the victims. They crowded the ambulance trains, the railroad cars, and the steamboats. In the general hospitals they were often more numerous than the sick from all other diseases and rivaled the wounded in multitude.

Even as comparatively recently as the publication of this remarkable work—1879—there was but a glimmering of the true causes of this scourge of armies. Lieut. Col. J. J. Woodward, Medical Department, U. S. Army, its distinguished author, in summing up his classical consideration of the causation of dysentery, says:

> For myself, I strongly incline to adopt the view of the contagion of the stools for a certain class of dysenteric cases, yet I frankly admit the recorded evidence on this head is by no means so conclusive as that which we possess with regard to typhoid fever.

We now know that dysentery in its various forms is produced by definite organisms and is infectious. The history of the numberless epidemics in armies, reports of which have been made as far back even as Herodotus, all point to this essential fact, and yet it was not until 1888 that Chantemesse and Widal first described the bacillus of dysentery, and not until 1898 that Shiga, a Japanese scientist, proved conclusively that the bacillus which bears his name is the true cause of epidemic dysentery.

There is, to be sure, a so-called tropical dysentery, due to amœba, but of this no case was found among the Russians in Manchuria, and it need not be considered here.

The contagium of dysentery is contained in the dejecta of the sick, and, like that of typhoid fever and cholera, must be eaten or drunk; in other words, taken into the intestinal tract, to produce the disease.

The conditions under which dysentery becomes epidemic are identical with those of typhoid fever, though some authors entertain the opinion that water is a less important factor in the spread of the Shiga (dysentery) than of the Eberth (typhoid) bacillus. This view seemed to be entertained by the Russian army physicians who, it will be recalled, attributed the typhoid in their armies to water infection and the dysentery to fly infection.

Epidemics of dysentery usually occur during the late summer and autumn—coincidentally with those of the typhoid and the fly seasons.

As a practical fact, however, the obtainable statistics show but 5,456 cases of dysentery for the period of the war ending July 1, 1905, of which 256 died.

On August 1 one report shows 418 cases and another 677, with 181 cases of pseudodysentery. On September 1 the report shows 646 cases of dysentery. At no time did the number of cases reach beyond about half the number of typhoid cases, and the mortality was less than half the rate for typhoid fever.

It is interesting to speculate as to why the two diseases did not increase proportionately, since the conditions were so favorable to propagation—with this possible difference, that dysentery is not a water-borne disease, or at least water plays a minor rôle in its distribution.

I find by reference to my notes regarding military hospital No. 31, Harbin, assigned as the contagious disease hospital, the following, under date of August 3, 1905:

> There are to-day under treatment 35 cases of typhoid, 135 dysentery epidemica, 2 varioloid, 1 diphtheria, and 23 erysipelas. About 100 cases of typhoid have been treated in this hospital during the last sixteen months, with a mortality of from 5 to 6 per cent, and a number of cases of varioloid.
>
> For the last four months a dysentery (Shiga) serum manufactured at the Government laboratory, St. Petersburg, was used with the most satisfactory results, so the surgeon stated. It was used in the 200 cases received since May last, among which but 3 deaths occurred. The average mortality, the surgeon said, being 4 per cent. The dose was from 10 to 100 gms. hypodermically. Four injections could be given daily, the total amount not exceeding 100 gms. The serum should be kept in a cool, dry place and is efficient for a year. I obtained a sample of it.
>
> There is an excellent laboratory at this hospital under charge of a professor from the University of Tomsk, which seems to be a working institution. I was told that all cases of typhoid were proved by the Widal test. No amœba have been found in the stools of any of the dysentery cases.

Except for the serum, the usual routine of treatment was observed in the dysentery cases. Regarding the serum treatment, I have not sufficient data to base a conclusion, but it certainly seems most promising and will bear further investigation—nay, demands it, so far as we are concerned, for thus far our experience with dysentery has not been happy.

From Kean's table I learn that during the four years of the civil war we had an annual average of 735.96 cases per thousand of diarrhea and dysentery, with a death rate of

22.91, and Colonel Woodward writes in the medical and surgical history of that war that "these disorders occurred with more frequency and produced more sickness and mortality than any other form of disease."

In the list of diseases given at the beginning of this chapter it will be observed that epidemic influenza looms up somewhat prominently. I have no doubt of the existence of this disease in Manchuria, for I had an opportunity to observe several cases of it on the attaché's train. I am quite sure that the diagnosis was often a tentative one, for I was told in the hospitals that not infrequently cases admitted with this diagnosis subsequently developed well-marked typhoid symptoms. Both typhus and relapsing fever were constantly present with the army, though in small numbers. Of the former there were 201 cases up to July 1, 1905, with a mortality of 35, and of the latter 170 cases, of which 11 died. I saw some of these cases in the quarantine hospital.

Smallpox cut very little figure in the mortality tables—209 cases, of which 12 died. All men who join the Russian army are vaccinated, and this is repeated before starting on a campaign, and thereafter whenever necessary, so there was no reason to expect a severe manifestation of the disease, even though it is endemic among the natives of Manchuria.

The 1,180 cases of scurvy, with 10 deaths, probably represents but a small proportion of those more or less affected by the scorbutic taint. I learned from many sources that scurvy modified the course of both medical and surgical cases, and I have actually seen cases of typhoid fever with well-marked scorbutic symptoms.

Anthrax was always present in the army. This was accounted for by the Russian physicians on the hypothesis that the infection came from the sheepskin lining of the overcoats. It will, however, be seen by reference to the chapter on the veterinary department that anthrax was epizootic in Siberia and might easily have reached the army through sheep, which were brought from there by the thousand. These cases were treated antiseptically, but all surgical procedure was avoided.

The remarkable absence of mumps and measles will be noted.

I have no record of the total number of cases of pulmonary and cardiac diseases.

The statistics of venereal diseases from the beginning of the war to September 1, 1905, are as follows:

	1904.	1905.
Syphilis	2,857	1,4[illegible]
Gonorrhea and chancroid	5,756	[illegible]

The statistical officer estimated that gonorrhea was to chancroid as 2 is to 1.

The total number of insane was 1,081, of which 244 were officers.

The foregoing résumé of the morbific conditions and results among the Russians in the Far East, so far as at present known, should afford lively satisfaction to those interested in the welfare of the soldier, both from a humanitarian and a militant standpoint. Russia, to be sure, had the advantage of the example of our sanitary errors—inexcusably bad—followed by those of the British in South Africa—not so bad as ours, but bad enough—and there was no reason why her soldiers and physicians should not have been fully alive to the importance of military sanitation. Then, too, the people of Russia were stimulated by the widely heralded sanitary work of their adversaries and spared no efforts to produce equally good results in their own armies.

Truly the war in the Far East has taught us many valuable lessons, but none is more valuable than the sanitary lesson of that conflict.

SOME SURGICAL SUGGESTIONS.

I was officially informed by the Russian authorities that wounds were inflicted by different missiles in the following proportion:

	Rifle.	Shrapnel.	Shell.
	Per ct.	*Per ct.*	*Per ct.*
Officers	71	11	18
Men	79	13	8

The statistical officer—Harbin—stated to me that wounds from cold steel were almost negligible; he had made no official compilation of such, but estimated that in 1,000 cases of wounded 17.5 suffered from saber or bayonet wounds. Of this number 17 per cent were inflicted by the saber and 83 per cent by the bayonet. In other words, in the total number of wounded (113,755, see Table I) about 2,000 were the victims of cold steel, 340 receiving saber and 1,600 bayonet wounds. I presume if the "dead" and "missing" had been examined this proportion would have been maintained.

I find in a report of the sick and wounded treated in the Red Cross hospitals of the Premorsk district the following:

Cause of admission.	Total to be accounted for.	Cured.	Died.	Transferred.	Remaining.
Gunshot wounds	14,737	9,262	54	5,216	162
Saber and bayonet wounds	57	41	1	12	2
Other wounds	983	605	1	320	42

The extraordinarily large proportion of wounded by artillery fire is certainly impressive. No other war has shown 29 per cent of all wounded officers and 21 per cent of men placed hors de combat by this arm. Wolseley says (Soldier's Pocket Book, p. 121): "According to the German medical returns, the number of all ranks in the German army killed and wounded by rifle bullets during the war of 1870 was 6,969 killed and 49,093 wounded, whilst by artillery fire the numbers were 695 killed and 4,389 wounded—that is, out of every 100 men (wounded) 91 were hit by infantry and 9 by artillery fire." Wolseley continues: "I have laid stress upon the fact that the effect of artillery fire is more moral than actual," etc. There seems to have been a very actual effect in Manchuria. The chief surgeon, writing from Kungchuling September 2, 1904, in concluding a report on the action of the Japanese jacketed bullet, says:

> But all this bears no comparison with the progress made in the artillery arm. On the 17th and 18th of August our (Russian) artillery fired more than 100,000 shells, and the Japanese artillery by far exceeded this. The havoc wrought by the latter can only be recalled with a shiver. The wounds caused by artillery fire were terrible and usually fatal.

It is interesting to note that the Russians report (Table I but 3,008 dead of the wounded treated in hospital. This is exclusive of the dead from wounds of those "evacuated" which, if in the same proportion, numbered approximately 1,120, or a total of 4,128 in 113,755 wounded. The reported "killed" numbered 19,467 and the "missing" 39,729, which may be counted as killed.

Based upon present information, we have, then—

	Killed.		Wounded.		Died in hospital and quarters of wounds.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Russians	[a]59,196	57.4	113,755	43.8	4,661	
Japanese	43,892	42.6	145,572	56.2	9,054	

[a] This includes the "missing," but not the Port Arthur casualties.

These figures are significant, or would be if we knew all the facts.

Why were 12 per cent more Japanese wounded than Russians?

Why were 14 per cent more Russians killed than Japanese?

Why did one-third more wounded Japanese die in hospital than did wounded Russians?

I quite appreciate the danger of drawing conclusions from insufficient data, and it is probable that my views will be somewhat modified when all the facts are available, so what is here said must be accepted tentatively, as the statistics are tentative.

I am uncertain whether or not there are new lessons for us to learn from this war regarding the stopping effects of the small-caliber high-powered projectile.

Is it possible that the 7.60 mm. cupro nickel-jacketed bullet of the Russians, which weighs 13.7 grams and has an initial velocity of 640 meters ($mv^2=551$), is more humane than the 6.50 mm. German silver-jacketed bullet of the Japanese, weighing 10.5 grams, with an initial velocity of 725 meters ($mv^2=552$)?

This can be answered in the affirmative if to kill is considered more humane than to wound.

The chief surgeon, writing from Liaoyang May 31, 1904, where "most of the wounded passed through my [his] hands," says:

> The experience here convinced me that the Japanese rifles are better than ours. The range of this weapon is very great. Within 200 meters, though the track of the bullet is small, the wounds were very fatal owing to the explosive effects, there being extensive shattering of bone, or in the abdomen tearing of intestines. At longer ranges, 400 to 800 meters, the wounds were less serious. Except in abdominal lesions the wounds inflicted by the Japanese rifle healed quickly. Even in abdominal cases, with severe lacerations of the intestines, several patients recovered after suture of the intestines where asepsis could be maintained. Wounds of the lungs were usually of a less serious nature, particularly those received at the higher ranges. Beyond 1,000 meters the bullet disintegrated, and the wounds of entrance and exit were considerably larger than the channel made by the missile in its course through the tissues, and bones were seldom shattered.

The chief surgeon is my authority for the statement that at the shortest ranges infection of the wound was infrequent, but at the higher ranges this was more often observed, due, he says, "to the foreign matter, especially clothing, driven into the wound." In concluding his report, he writes:

> We can say that the Japanese bullet is modern and humane. About 52 per cent of the wounded were returned to the fighting line inside of one month.

Later this same authority wrote on the subject of "humane" bullets in a less optimistic frame of mind, as follows:

> Fight only during the warm season, before frost; let the battle be on soft, dry ground, free from stones or rock, at ranges not less than 250 meters. See that the men go into the fight with empty bowels and bladder and that there be no shooting at heads. If these conditions can be enforced, then the bullet so deadly to-day might prove "humane."

Doctor Wreden thinks that the modern jacketed bullet is, under certain conditions, more destructive than the old (large caliber) bullet, and that the lessened mortality among the wounded is wholly due to improved surgical technique. He says:

> From the beginning of the war to January 1, 1905, only 1 amputation was required in every 200 cases.

The statistics above quoted would indicate that the Japanese bullet is humane, as it was the chief factor in killing outright 35 per cent of all Russians hit and wounding per cent, of whom but 3 per cent died. To be killed outright is certainly more humane than to suffer long from painful and disabling wounds.

The shrapnel bullet is more than twice the caliber of the rifle bullet and with but one-sixth its velocity; it is not jacketed, and when the projectile bursts the shrapnel frequently deforms, assuming all sorts of shapes. While the shrapnel has no hydrodynamic effect, it inflicts very severe wounds, with great destruction of both hard and soft tissues.

Of shrapnel Colonel Havard writes: "These shells were much more numerous and did most of the execution." Of the shimose shell he says it "explodes with great noise on striking the ground, excavating a little crater and giving off a small cloud of thick brown smoke. Except when exploding within a short distance, it does but little mischief, for it breaks into a multitude of fragments, most of them minute, and without much power of penetration."

Has the time yet arrived for us to draw anything more than very general conclusions from the sanitary statistics of this war? I think not. I find in looking over my notes numerous entries which give some indications of the direction in which the experience will probably work out. August 16, 1905, Doctor Brentano, of the German Red Cross hospital, said that altogether 600 cases of all kinds had been treated in his hospital. These include 127 surgical operations, of which 4 were amputations—1 shoulder, tetanus, died; 1 thigh, lower third, shrapnel wound, infected, recovered; 1 arm, middle third, tetanus, died; 1 leg (Gritti operation), shrapnel wound, recovered. There were three resections, 2 of hip and 1 of wrist, all of which recovered. About 10 per cent of the surgical cases died, as follows:

Tetanus, 4; sepsis, 4; peritonitis, 1; meningitis, 2; empyema, 1, and rupture of spleen, 1. Only 1 celiotomy was done for gunshot wound of abdomen with peritonitis. This resulted fatally. Four pelvic abscesses following gunshot wound of abdomen were evacuated per rectum and recovered. No cases of bayonet or saber wounds were received. Doctor Brentano further said that almost all cases of shell and shrapnel wounds arrived infected. In one case (noninfected) a shrapnel bullet penetrated the right lung and was removed from the back. Cases of gunshot wounds from rifle bullets were usually sterile.

Doctor Butts, in charge of a Red Cross hospital at Gotsaidan, furnished the following statistics: From 10 to 20 per cent of all missiles lodged; 3 to 4 per cent of bullets lodged. All shrapnel wounds were infected and but few bullet wounds. Of 50 cases of infected wounds of head operated upon, one-half died; of 150 sterile cases, 10 per cent died. Doctor Butts is also of the opinion that rest and surgical noninterference are the indications in wounds of the abdomen; 50 per cent of such cases die of peritonitis. He reports 5 cases of abdominal abscess following wounds, all of which recovered.

Among 915 operations there were 75 amputations, 15 resections, 25 excisions, 3 aneurisms, 200 trepanations.

Doctor Butts treated 24 cases of gangrene, of which 23 died, and 3 cases of tetanus, all of which died.

Regarding the anatomical location of wounds, I have no data of sufficient extent to be of general value. I have heard it stated casually that the number of wounds of the head and right upper extremity was unusually large, due to the necessary exposure of these parts in the act of firing, but I have not regarded this as an authenticated statement.

From what I have been able to gather from conversation with Russian surgeons, I think it probable that we will have no occasion to modify our views regarding the effects of high-powered bullets at different ranges. Doctor Wreden writes:

> The explosive effects of the Japanese bullet in spongy bone tissue is observed only at close range (100 m.), beyond which the distinction is slight, but in dense osseus tissue explosive effects are observed up to 800 m. Within 200 m. wounds of the cranium are usually fatal, the hydrodynamic effects being most marked, and within 100 m. the calvarium is greatly comminuted. Beyond 200 m. tangental wounds of the head are not usually fatal, but penetrating wounds are lethal up to a 1,000 m.

Doctor Wreden regards wounds of the face and neck as serious, and if the latter are complicated by injuries to arteries, trachea, or esophagus they are usually fatal. Colonel Havard reports a wound of the cervical region in the case of Prince Murat in which the bullet transversed the neck from side to side, coming out close to the internal carotid artery, and another case in which the missile entered at the point of the chin and emerged close to the spine on the right side. Both of these cases were convalescing.

So far as I could ascertain, there is a general consensus of opinion that bullet wounds of the lungs are not serious.

The impression left on my mind is that celiotomy for any purpose was a rare operation. This impression was gained not from statistics, for such were not obtainable except from a single hospital here and there, but from conversation with many surgeons. The only really definite statement I have on the subject is found in a report made by a chief surgeon, of which I will submit a free translation:

> Among the most serious wounds we have encountered are those of the abdomen, in the treatment of which very little has been accomplished. We can only say that the more rest the patient can have from the very moment of the infliction of the wound the better the result. The character of the missile—bullet, shrapnel, shell, or cold steel—is of great importance in determining the result, and lesions caused by each of these should be considered separately.
>
> The severity of wounds of the abdominal region caused by the modern bullet is directly proportionate to the range. As the result of the experience gained in several operations done for penetrating gunshot wounds of the abdomen at close range, I was deeply impressed with the great explosive effect of the modern bullet. In some of the cases in which the stomach was full it was burst into pieces and entirely separated from the surrounding organs. A like result followed with a full bladder, and great havoc was wrought in liver, spleen, and kidneys. In such cases, as was to be expected, the symptoms of shock were pronounced and resembled those of internal hemorrhage. The wounded man almost invariably fell to the ground, complaining of intense pain in the belly, but did not lose consciousness. If left quiet, the pain subsided and the shock disappeared.

The report adds:

> These cases never spoil the statistics of the rear hospitals, for they die on the field or at the dressing station.
>
> Beyond 400 meters the explosive effects were not observed, and the patients did not at once fall. Soon, however, symptoms of shock supervened, with vomiting, especially in alcoholics, and the wounded man laid down. This condition usually continued for several days and has led to early operative interference, which only resulted unfortunately.

The reporter estimated the mortality from rifle-bullet wounds of the abdomen at 40 per cent of such cases. This was based upon nine months' experience in the Far East.

Shrapnel wounds pentrating the abdomen were much more serious than bullet wounds, the mortality being about 80 per cent. The same Russian surgeon, writing of these wounds, says that when they involve the liver, spleen, or kidneys they caused death quickly from extensive hemorrhage; but in the stomach, intestines, or bladder the shrapnel inflicted much severer wounds than the rifle bullet even within the explosive ranges.

Wounds of the abdomen from ricochet bullets or shell splinters were usually so extensive that surgical interference even under the best conditions would probably have been ineffective. Such wounds were particularly observed among artillerymen. The external appearance of these wounds differed from that made by the ordinary bullet, the wound of entrance being considerably larger; moreover, the course of the bullet was much more irregular. Large pieces of shell sometimes caused immense destruction of tissues, with almost instant death, and yet such cases sometimes recovered.

I have a report on saber, lance, and bayonet wounds which I will venture to quote. The reference to Cossack lance wounds is interesting as involving the question upon whom the wounds were inflicted, for there were not many Japanese prisoners and the Russians did not remain on the field long enough to examine the dead.

> The wounds from the Cossack lances are large and of the most serious nature, for not only does the point enter the body, but the entire weapon up to the handle. Such wounds are almost inevitably fatal, the wounded dying on the field or en route to the dressing station.

In considering bayonet wounds a word must be given to the weapon. The Russian bayonet is rapier shaped. It is made for thrusting, not cutting, and it inflicts only punctured wounds, the edges of which quickly contract upon withdrawing the weapon.

The Japanese bayonet is a knife, long, strong, pointed, and sharp, and with it not only can punctured wounds be inflicted, but incised, contused, and lacerated wounds as well. Wounds of the abdomen caused by the Japanese bayonet are generally long gashes, through which the abdominal cavity is emptied of its contents, causing speedy death.

The chief surgeon above quoted, in summing up his conclusion, says that to recommend the doing of laparotomy in a divisional mobile military hospital during the progress of a battle with a constant inflow of wounded is unwise.

> From among several evils the least should be chosen, and time and strength are not available for such operations under such conditions. These abdominal cases should not be operated on, but should be given rest, temporary dressing, and morphine.

Finally, he says, active surgical interference in abdominal cases depends upon the temporary location of the wounded, his condition, and upon the kind of weapon with which the wound was inflicted. * * * The result of treatment depends upon the method adopted, and in all such cases absolute rest is essential for at least a week. Morphine is our sheet anchor in all wounds of the abdomen.

I have nothing but praise for the first-aid packet which is carried by every officer and enlisted soldier. The officer usually attaches the packet to the scabbard of his sword, thus assuring its constant presence, for a Russian officer is never without his sword.

The soldier is supposed to have a special pocket in the front of his breeches, on the right side, which is devoted to the first-aid packet, but, so far as I saw, this rule seemed more honored in the breach than the observance, though a place was always found for the packet somewhere.

The Russian first-aid packet is much like ours in general appearance and size. It contains 1 antiseptic bandage of sublimated gauze, 3 meters; 2 antiseptic compresses of sublimated gauze and cotton, and 1 safety pin.

These are hermetically sealed in a rubber (waterproof) cover, and the packet is thus issued for use at the dressing stations, etc., but when issued to the man it has an additional cotton-drill cover on which is printed a list of contents and the following directions:

1. Take off the outer (cloth) cover.
2. Open the (rubber) package, take out the compresses, and place them on the wound, absolutely dry.
3. Apply the antiseptic bandage over the compresses, but not too tight.
4. Fasten the end of the bandage with the safety pin.

NOTICE.—In case of a perforating wound, place one of the compresses over each opening.

The first-aid packets, and, indeed, all other surgical dressings, were manufactured in the Government fabrique at St. Petersburg. Pharmaceutical preparations, surgical instruments, in fact everything pertaining to the armamentaria medicorum et chirurgicorum, were made at this great plant. I spent some time inspecting this interesting place and could have profitably spent much more. The care with which the dressings were prepared was most minute. I made the following note regarding the first-aid packets, 16,000 of which were turned out daily at a cost of 15 kopecks (7 cents) each.

> The raw materials (for dressings) are purchased by contract, much of it coming from Germany, and all are antisepticized by heat (steam under 1.5 atmospheres). A certain amount of the dressings is sublimated; indeed, all that is used in the first-aid packets and the field. This is stained a pinkish color to distinguish it. The dressings in these packets are rolled under glass, are compressed, and then hermetically sealed in rubber cloth as above stated. I saw a number of these packets suspended in water, where they had been for two years, and the contents yet remained dry.

I might here add that I observed a method of packing gauze and cotton, which is the invention of one of the army physicians on duty in the factory, which is a great advance over anything I have seen at home. Instead of being rolled it is folded in accordion plaits, by which method only so much as is needed is withdrawn from the package at a time, thus avoiding possible contamination of the unused part.

A chief surgeon wrote just subsequent to the battle of Liaoyang that he was impressed with the care shown in distributing the first-aid packets and the careful way they were carried by the officers and men. The first-aid bandaging was readily done by the men, though not under strictly aseptic conditions; nevertheless, though the heat was great and flies plentiful, there was no sign of infection during the first twenty-four hours. The first-aid packet proved of invaluable service to the wounded during transportation. Doctor Werden objected to the red dye in the gauze, which he thought occasioned a cutaneous inflammation, aggravated by heat and perspiration. But might not this have come from the sublimate itself? Doctor Werden suggested that the gauze should be soaked in a 5 to 10 per cent solution of creosote, the especial advantage of which is that it would keep flies away from the dressing.

The first-aid packet has passed beyond the experimental stage and is now universally recognized as a legitimate part of the soldier's field equipment. It has both a positive and a negative value—positive because of its appropriateness and negative because it prevents the use of an inappropriate dressing, which would surely happen if a proper dressing was not available.

The consensus of opinion among the Russian surgeons with whom I discussed the matter was that rifle-bullet wounds were usually sterile and wounds from artillery projectiles usually infected. In summer there was much less wound infection than in winter. This is explained by the fact that the body and clothing were more frequently washed in summer than during the cold season and that the clothing was lighter and less likely to harbor infection. I find this somewhat startling statement in a report to the Emperor under date of April 15, 1905:

> The last evacuation (Mukden) was carried on in excellent manner, being completed only by the difficulty in healing the wounded who suffered from blood poisoning and gangrene, resulting from fur clothing and cold weather.

Doctor Botkin told me that after Mukden there were many cases of frostbite, and there was also a peculiar anæmic condition with purpura, which some of the physicians thought was due to the cold, which reduced the fibrinogen. I fancy they had not seen much scurvy in their practice up to that time. Doctor Chervinsky told me that after the battle of Sandipas a number of wounded were frozen to death as they lay on the ground.

I inquired of many surgeons if they had used or seen used any new or special methods of treatment, but none had. Doctor Shaffer, of the Germany army, told me he had not infrequently observed the Russian surgeons painting the surface about wounds with tincture iodine, but he did not learn the reason therefor. This remedy seemed to be a favorite one among Russians, and always occupied about the largest bottle in the dispensary.

I could get no exact information as to the percentage of infected wounds that came under treatment.

The surgeons at Irkutsk told me that all the cases they received were infected. By the way, that reminds me, I saw 6 cases of hip-joint amputation in one Red Cross hospital there, all of which were doing well.

Tetanus was by no means an infrequent complication of wounds. In the surgical clinic (military hospital No. 2), Harbin, through which 7,000 patients had passed, there were 12 cases of tetanus, of which 2 recovered. The serum treatment was ineffective.

The statistical officer at Harbin reported that tetanus was in the proportion of less than 2 to each 1,000 of wounded. Of the 250 cases of tetanus, 87 per cent died.

Doctor Chervinsky said that his largest number of cases of tetanus occurred after Mukden. He got the best results from chloroform and chloral, but nothing from antitoxin.

Erysipelas was always present, and it totaled 5 cases per thousand of wounded.

I believe that the latest surgical procedures were used in the hospitals in the Far East. I saw a great many surgical cases in the wards and but few in the operating room.

Rubber gloves were not generally used; in fact, I think their routine use was only required in the German Red Cross hospital, though I saw an occasional pair in the Russian hospitals.

Silk was universally used for ligatures and sutures. The Russian surgeons were quite emphatic in their condemnation of animal ligatures in field service, and some of them told me they never used any other than silk ligatures under any circumstances, as there was no certainty of sterility in any other suitable material. Doctor Chervinsky told me that linen thread treated with celloidin was quite as good as silk and much cheaper. So far as observed, the surgical armamentarium was good. In the beginning of the conflict there were obsolete instruments on hand, which, as with us, were thrown in to meet the emergency, and quickly disappeared, to be substituted by modern instruments. Regarding instruments, a Russian surgeon writes:

> I am sorry to say that I saw (May, 1904) many instruments with bone and wooden handles. There was a great shortage of artery forceps and hypodermic syringes. The recently introduced lamps proved of the greatest service, especially after Liaoyang, where we worked

three days and nights. This battle not only illustrated the advance made in surgery, but also the great improvement in weapons. We can figure 1 dead to 3 wounded.

I have not burdened this report with an account of the many interesting surgical cases I saw in the Far East, but so far as possible have endeavored to deduce lessons for our guidance from the general surgical experience of the war.

We learn therefrom that there is no occasion to modify the views heretofore held that celiotomy on the battlefield is interdicted. In such cases expectancy is the correct procedure, and rest and morphine the treatment. The suggestion that we should follow the rule of the ancient warriors, who went to battle in clean raiment and clean body, is valuable. Add to these an empty stomach and bladder and there is little left to be done but trust in Providence.

So far as I could learn through inquiry no special precautions were taken in disposing of the dead after battle. I was informed that those bodies buried by the Russians were usually put into the excavations made in constructing earthworks and covered with earth. The Russian people are particular in their funeral rites, and an orderly ritual indicates respect for their dead. Even in the field the grave was, when possible, marked by a wooden cross, no matter how crude.

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(DECEMBER 1, 1906.)

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2

NOTE.

General maps of the region in which the war occurred are found in Part I of these reports.

REPORT ON RUSSO-JAPANESE WAR.

CONDENSED ITINERARY.

I left Manila March 2, 1904, and reached Yokohama March 19. After delaying here four days to procure a necessary outfit of warm clothing, I proceeded to Tokyo on March 23 and reported to the United States minister on the following day.

Permission to go to the front was withheld by the Japanese war office until July 20, 1904, on which date I left Tokyo by rail for Shimonoseki, and thence for Liushutun, Dalny Bay, where I landed July 27. Marching overland, I reached the headquarters of the Second Japanese Army, General Oku, at Haicheng, on August 8, 1904. I remained with this army during the battles of Liaoyang and the Shaho until October 30, when, in obedience to cabled instructions from the United States minister at Tokyo directing my recall, I set out to return to Japan, spending four days, November 1 to 4, with the Third Japanese Army before Port Arthur and reaching Tokyo November 13. On November 19 my orders were countermanded by cable, and I was reassigned to duty as a military observer.

After a tedious delay, due to diplomatic negotiations, I left Tokyo by rail December 18 for Osaka, whence I embarked on transport for Dalny, where I arrived December 24. On the following day I reached the headquarters of the Third Japanese Army, General Nogi, to which I was now assigned, and witnessed the closing incidents in the siege of Port Arthur. Under special permission I remained at Port Arthur until March 3, 1905, for the purpose of studying the Russian defenses. On March 3 I departed by train for Liaoyang to join General Nogi, and reached his headquarters on the night of March 8 during the battle of Mukden. I remained with the Third Army during its movements after Mukden and until the conclusion of hostilities. On September 17 I started to return from the front, reaching Tokyo September 29 and Washington, D. C., November 11, 1905.

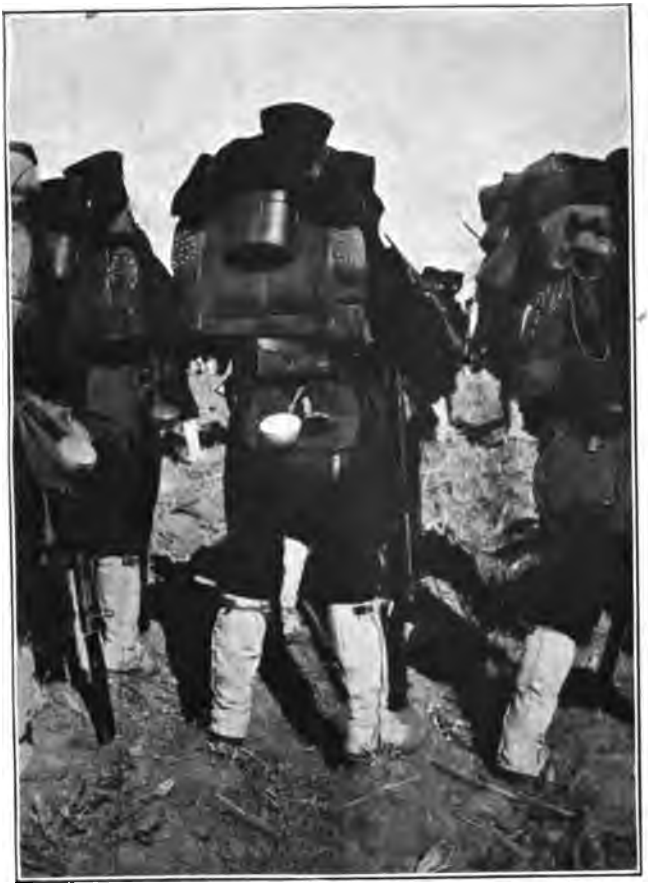
THE JAPANESE INFANTRY.

Being a poor nation, Japan's principal reliance in time of war is on the infantry, which has, accordingly, received more attention relatively than the artillery or cavalry arm. The Japanese infantry has been frequently referred to as incomparable, and, judging by its achievements in the Russo-Japanese war, it is not too much to say that it can undoubtedly hold its own against the infantry of any other nation. Highly intelligent, brave to the degree of recklessness, quiet and orderly in his habits, the Japanese infantryman possesses all the qualities sought for in a soldier under modern conditions of warfare. Japan has indeed reason to be proud of her superb infantry, whose achievements attracted the attention of the civilized world.

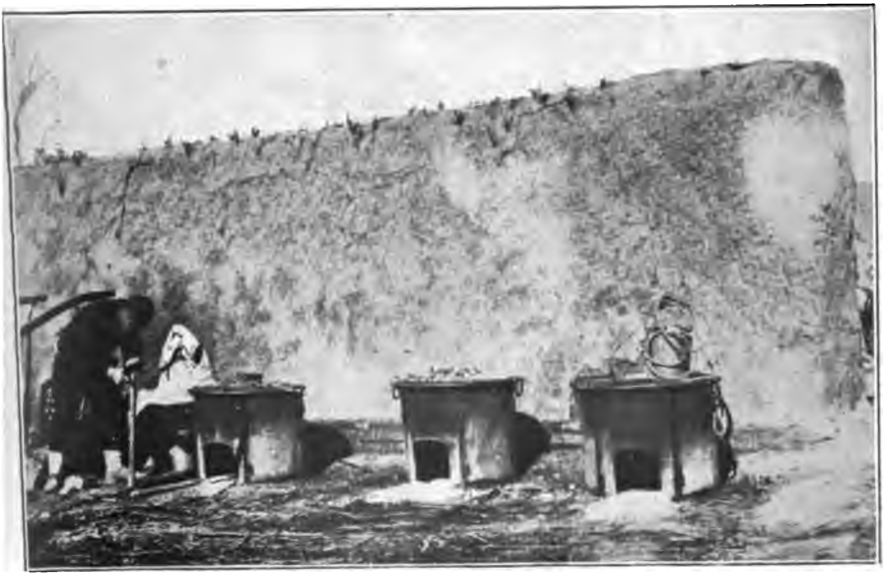
At the outbreak of the war the minimum height prescribed for the infantry recruit was 5 feet 3 inches. As the number presenting themselves annually under the conscription law far exceeds the requirements of service with the colors, only the strongest and most robust are selected. A finer set of soldiers physically than the first-line troops of Japan would be hard to find. Although small of stature, they were unusually sturdy and stocky and capable of great endurance. These splendid troops, however, gradually disappeared as the war progressed, owing to the heavy casualties, and the general appearance of the men after Mukden was markedly inferior from a physical standpoint to those seen during the first summer of the war. An edict by the war minister in the spring of 1905 reduced the limiting height for infantry recruits 1 shun (about one-tenth of a foot), indicating that the previous standard was too high to secure the necessary number of conscripts called out to make good the losses in battle and for the organization of the new divisions. The period for service in the second reserve (Kobi) was also extended five years, with the result that many soldiers approximating 40 years of age appeared in the ranks.

Generally speaking, the physique of the officers was below that of the men, there either being no limiting standards of physique in their case or these standards being considerably lower.

The infantry is organized into regiments of 3 battalions



1. JAPANESE INFANTRY SOLDIER.



2. JAPANESE COMPANY KITCHEN.

each battalion having 4 companies of 3 zugs, or platoons, which latter are subdivided into 5 subsections, or squads, each under a noncommissioned officer. The strength of a company is 5 officers, 30 noncommissioned officers, and 200 privates. The privates are graded as second class, first class, and superior soldiers, the grades being indicated by one, two, or three narrow yellow bands on the bottom of the sleeve.

The total combatant strength of a regiment is 2,854, and of a brigade of two regiments 5,716. Each regiment is equipped with 12 bicycles, but owing to the wretched roads little use was found for them except for messenger service in the larger towns.

Each company of infantry carries 94 portable tools, viz., 5 hatchets, 67 spades, 17 picks, and 5 folding saws.

In constructing intrenchments the soldiers are divided into two reliefs, each working thirty minutes. At a whistle signal the relief at work drops its tools and steps out of the trench, being immediately succeeded by the second, which has been drawn up in line in rear.

The soldier's kit weighs 42½ pounds without rifle, which weighs 9 pounds 8½ ounces with the bayonet—a heavy load, considering the Japanese soldier's stature and weight. This does not include the special articles of winter clothing issued for the winter in Manchuria.

The kit includes a rawhide knapsack with the hair side out, a red blanket,[a] dark-blue overcoat, canvas haversack, aluminum mess can, water bottle and cup, shelter-tent half and 2 poles, belt with 3 cartridge pouches, and elongated cotton bag.

The knapsack contains 1 pair spare shoes, strapped on outside, 1 pair socks, 1 shirt, 1 pair drawers, 2 days' emergency rations (tinned meat and biscuit or desiccated rice), 2 cardboard packets containing 30 rounds of ammunition, and a housewife containing comb, scissors, thread, needles, etc.

Certain spare parts of the rifle are also carried in the knapsack, such as striker, bolt head spring, cocking piece, etc.

The shelter-tent half is a piece of brown waterproof can-have eight days' rations accompanying him on the march, as follows:

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[a] Toward the end of the war blankets of a grayish-brown color were issued, a decided improvement over the brilliant red pattern.

The day's ration (that is, after breakfast he fills his ration tin with the remainder of that day's ration), 1; heavy baggage of battalion, 1; provision columns, 4; emergency rations (carried on person), 2.

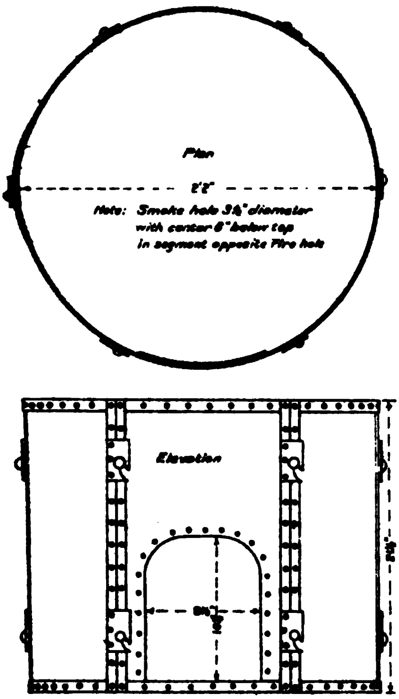
Being a rice-eating nation and depending upon boiled fo almost exclusively, the messing arrangements for the Japanese army are exceedingly simple. The cooking stove is cylinder of sheet iron, without top or bottom, in six segments. Each segment has all its edges stiffened by reenforcing strips of iron, one-eighth inch thick and three-fourths inch wide, fastened on by rivets. One vertical edge of each segment has two studs with boltheads, while the other edge has tw slotted clips. The dimensions and method of assembling are clearly shown on Plate I and the accompanying photograph.

The cast-iron kettle is made thin to secure lightness. It has two handles and fits into the top of the stove. The rice boiler or colander fits into the kettle, resting by its handles on the depressed rim of the kettle. The stove is fired with wood or kaoliang, being well suited to the latter. The rice is placed in the colander, and after the water in the kettle has reached a boil the colander is lowered into the kettle and covered with the wooden cover which belongs t the outfit. As the Japanese like their rice with a firm grain it requires only twelve to fifteen minutes to cook after being placed in the boiling water When the cooking is finished the colander is lifted from the kettle and allowed to drain, leaving the rice grains dry and firm.

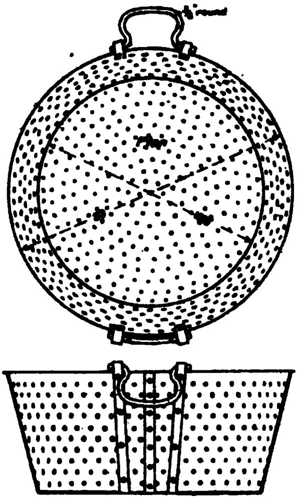
Each outfit will cook rice for 40 men at one operation, that the process of cooking must be repeated with some of the stoves constituting the company allowance to provide enough for a company of 235 men.

The rice is first washed in galvanized-iron cans of 2 feet diameter and 30 inches height, the grain being churned by two sticks tied together about 2 feet from the lower end, the water being changed several times. These galvanized cans also serve to hold the rice after being cooked and to transport it considerable distances from the kitchen if necessary. The rice is served into the men's mess tins with wooden ladles or boxes, each holding a ration.

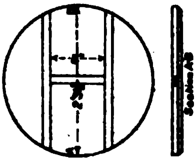
Japanese Cooking Outfit



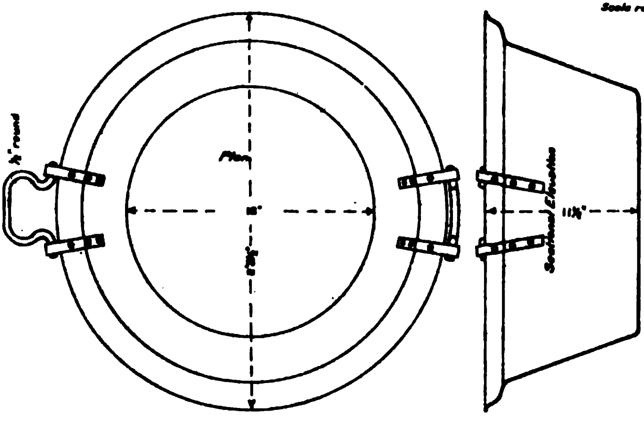
Sheet Iron Stove



Tinned Sheet Iron Colander



Wooden Lid for Kettle
Scale reduced



Cast Iron Kettle

PLATE I

The same cooking outfit also serves for boiling water for drinking and for boiling vegetables and meats. The mess tins, which are of aluminum, contain several compartments for pickles, vegetables, and sauces. These mess tins also serve to cook rice, and it was a common sight to see men detached from their kitchens boiling their rice over a fire with four or five tins strung by their handles on a pole.

Knives, forks, and spoons are not required, as each soldier carries his chopsticks or readily improvises a pair from twigs or a bit of packing box.

The cooking outfits are transported on pack animals, the stoves being knocked down, and, with kettles, cans, and other small utensils, carried in a netting bag, which is slung from the pack saddle.

The regulation allowance of cooking outfits for a company of 235 men is four.

Beef on the hoof is sparingly issued when convenient and possible. After the battle of Mukden, the left wing of the Japanese army received considerable fresh beef, the cattle coming over the Mongolian border, and many herds of fine animals were seen in the vicinity of Fakumen during the summer of 1905, en route to the various army units. Fresh pork is also occasionally issued, Manchuria being well supplied with pigs. In the Second Army during the summer and autumn of 1904 there was some pillaging of pigs and poultry, but on the whole the Japanese troops refrained from depredations and their treatment of the natives, while strict, was eminently fair and just.

The entire problem of feeding the army is much simplified by the peculiar food of the Japanese. With rice, canned or dried fish, the various national sauces and pickles, and the dried or canned vegetables of his native land, the Japanese soldier is well satisfied. His food is not perishable and is easily prepared and transported.

The tinned beef issued as part of the emergency ration appeared of excellent quality, but was flavored with soy, which sauce appears to be an essential component of all Japanese foods. To the foreigner the flavor soon becomes distasteful, and the beef became palatable to me only when made into a stew with plenty of salt and pepper.

The daily life of the Japanese soldier, as noted in the

Third Army, during the summer of 1905, was about as follows:

He rises at 5 a. m. and breakfasts at 6 a. m. without any music, calls, or formations. From 7 a. m. to 10 a. m. he parades for three hours' drill, instruction, or exercise. At 12 he eats his dinner. In the afternoon he again parades for two hours between 3 and 6 for further drill and instruction. Thoroughly drilled and proficient soldiers are excused from afternoon parade. The evening meal is at 6 or 6.30, and at 9.30 the soldier retires for the night.

The absence of music[a] in the Japanese army is noteworthy and impresses the foreigner strangely. Men make their way to the place of parade individually and without bugle calls. Hours not devoted to drill or instruction are spent as the men like, usually in their quarters, sleeping, washing clothes, reading, or writing letters, of which latter they seem very fond. The men are very quiet in their habits, and are not given to roaming about in search of excitement, as is the case with the American soldier when off duty.

Outpost organizations, as a rule, are changed every ten days. Men on outpost duty are liberally fed and their comforts attended to as much as possible.

Men generally bathe daily, going to considerable trouble to fit up appliances for heating water. At all étape stations and at the larger headquarters the Japanese wooden bathtub, or a special canvas camp tub, with charcoal heater, was to be seen. The soldiers commonly bathe in the large jars used by the Chinese for storing a supply of water or in empty saké casks.

When on duty discipline appears to be very strict and quite like what obtains in other well-regulated armies. When not on duty, and particularly on occasions of amusement or entertainment, a spirit of camaraderie and good feeling, amounting almost to familiarity, obtains in all ranks from the highest officers to the privates.

Drunkenness is almost unknown, and violations of law and regulations very rare. Although men were occasionally seen under the influence of drink, I never saw a single case of a real helpless drunk. This was not because saké was not obtainable, for it was not only an article of issue, but was sold by the canteens, which followed the troops closely at all times.

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[a] The First, Second, and Third Armies had each one band attached to army headquarters.

The Japanese theory that every man can become a good soldier if he will only put his heart into his work seems to pervade all ranks and permits a degree of control over the men which would be out of the question with any European or American army. In other words, the individual soldier can be pretty well depended upon to carry out instructions given him regarding his duties, health, deportment, etc., without constant supervision or inspection on the part of his officers. It is simply a matter of temperament, in which the Japanese possess a decided advantage over other nations.

No description of the Japanese soldiers' life in the field would be complete without some reference to the various measures adopted to provide entertainment and recreation when the armies were at rest. Wrestling and theatricals are the two national pastimes, and were freely indulged in by the troops. Nearly every village in which troops were billeted possessed its wrestling ring, where the soldiers engaged in friendly contests daily, usually in the evenings. Theaters, requiring more elaborate preparations, were limited to the larger étape stations and headquarters. Every national holiday, fête day, or anniversary was eagerly seized upon as a pretext for entertainment, more or less elaborate, in which all officers and men of the organization concerned took an active part.

Some of these affairs were of imposing magnitude, such as that of the First Army to celebrate the anniversary of the battle of the Yalu and that of the Ninth Division to commemorate the anniversary of the capture of Port Arthur. The latter entertainment was given at a Chinese farmstead called Nanling, about 1 mile south of Chinchiatun, within sound of the outpost firing. The fête extended over two days, so as to permit the entire division to attend. Weeks were spent in preparations and an enormous amount of labor and material expended in making the affair a success, which it was from every point of view. A grove of tall cottonwoods some 250 yards square was converted into a Japanese fair, with numerous booths for the dispensation of food and drink, and with the inevitable accompaniment of a huge theater and wrestling ring.

Artificial cherry blossoms, flags, lanterns, etc., strung fr the trees made the grove look decidedly bright and ga Soldiers dressed as geishas attended to the wants of t guests, while numerous groups of dancers, musicians, pe dlers, etc., contributed to the entertainment. The ingenuity and artistic taste displayed by the soldiers in t construction of the numerous booths and decorations fr the scanty material available was quite remarkable.

Athletics also form a prominent feature of the soldier training and were freely practiced on occasions of entertainments. The prizes offered in wrestling and othe athletic contests were usually inexpensive packages of cigarettes, stationery, towels, handkerchiefs, soap, etc.

The many entertainments gotten up for the benefit of the troops were not only intended to afford pleasure fo the moment, but to keep up the spirits of the soldiers and to counteract homesickness.

The training and instruction of the infantry is most thorough. In drilling, movements are executed with smartness and precision, and, in the domain of minor tactics, the infantry soldier displayed a high degree of skill and efficiency. Although much attention is paid to instruction in target practice, the shooting did not impress me as being very good, considering the intense volume of fire delivered by the firing line. Volley firing was but rarely used by the Japanese, who generally refrained from opening fire until mid-ranges were reached, when they invariably resorted to file firing, each man firing rapidly, too rapidly, in fact, for good results. While this method produced an enormous hail of bullets, filling the air with lead, accuracy of shooting suffered in consequence, and the expenditure of ammunition impressed me as being out of all proportion to the casualties inflicted on the Russians.

In their tactical formations for combat the Japanese employed the same general methods as prescribed in the regulations of all modern armies. There was a firing line, line of supports, and line of reserves, all supplied by the same regiment. The strengths of the various lines and their distances apart varied according to circumstances, and in the several combats of which the tactical formations were known there were no two cases exactly alike. Generally speaking, the firing line was rather dense, the skirmishers being posted at intervals of about 1 pace, so as to secure a heavy volume of fire. Ground is gained by rushes of the firing line from one flank of each deployed unit. For instance, if entire companies are deployed on the firing line, the right zug or platoon would rush forward, being covered by the fire of the two remaining zugs; then the second zug would rush to the line of the first zug, being covered by the fire of the first and third zugs. Finally the third zug would rush to the line already established. The lengths of rushes varied according to the topography and the severity of fire. When close range is reached and the losses by rushes of entire platoons or sections would become too heavy, ground is gained by individuals from a flank moving successively until line is again formed. Movements are controlled by zug commanders by whistle, there being special calls for advancing, firing, and halting. If the firing line finds the enemy's fire too severe to continue the advance, it intrenches itself, as may also the supports and reserves, and awaits further developments

The strength of the firing line appears to be generally one battalion of a regiment, but frequently, when more front must be covered, it may be much more. Thus, at the attack on Manjuyama Hill by the Thirtieth Regiment of the Second Division during the battle of Liaoyang, 10 companies deployed, each two zugs in first line and one in support, leaving but two companies in reserve. During the attack on the Russian inner line at Liaoyang in front of the Fourth Japanese Army, the Fortieth Regiment of the Tenth Division deployed 11 companies in the first line, leaving but one in reserve.

Perhaps the best commentary on Japanese battle tactics is that of General Kuropatkin, as disclosed in a Russian document, entitled "A Study of Japanese Tactics," captured at Mukden, and of which the following is from a Japanese translation, all dates being old style:

A. HILL FIGHTING AND ATTACKS.

The Japanese attack in a continuous succession of waves and never relax their efforts by day or night. If the enemy's front is narrow, they seek to outflank it; if extended, to pierce it. Their movements are usually carried out under cover of night and are followed by an assault on the particular portion of the positions selected for attack.

When attacking in flank they invariably make a simultaneous attack against the front of the position. It is very necessary, therefore, to make bold reconnoissances in order to be able to distinguish between the real and the feigned attack.

A characteristic of Japanese tactics in the mountains is that they advance along the sides of the hills on a very narrow front and carefully avoid valleys. They generally attack our positions from a flank. These would seem to be the best tactics to pursue in the mountains of Manchuria. If the Japanese find it absolutely necessary to march along a valley, they wait until night to do so.

The Japanese mountain artillery moves in considerable numbers and with great rapidity in the mountains. Their mountain guns always keep pace with their infantry and are often boldly pushed forward to positions on our flanks or even within our lines of defense. Compared with the Russian field guns, the Japanese mountain guns are directly inferior both in rapidity of fire and in mobility over flat country. They have, however, achieved considerable successes at times over our batteries by rapidly changing their positions and taking up new and better ones. The Japanese show considerable skill in these movements, and they appear to have some special equipment that enables them to move rapidly.

Moreover, their guns very soon come into action on positions captured from us, and they afford invaluable support to their infantry, enabling them to retain what they have won.

B. TACTICS IN FLAT COUNTRY.

The Japanese are in the habit of making separate and independent attacks on each of the various portions of our positions. The operations are carried on chiefly by night. For example, on the night of September 27–28, 1904, they attacked the heights near Kushutzu village.[a]

On the night of September 29–30 they attacked and occupied the heights of Durugovbaya and a temple to the east.

At daybreak on the 1st of October, 1904, they captured Houchai Hill, and on the 3d of October they seized some heights and a road in the vicinity of the above hill.

On each of these occasions, directly the positions had been captured, the Japanese opened a heavy artillery fire on the Russian trenches in the neighborhood, thus clearing the ground for further action.

In making attacks the Japanese usually deliver the assault just before dawn, so as to be in possession of the place by sunrise. During the day they strengthen the position as much as possible.

In order to deceive the enemy as much as possible, the Japanese make one or more false attacks before delivering the real one. These feints are supported by heavy artillery fire. Sometimes the real assault is delivered under cover of a general attack along the whole line. The main object of these false attacks appears to be to entice the enemy's reserves away from the real point to be assailed. For example, on the

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[a] All dates are old style

11th and 18th of August, 1904, they made false attacks on the Third Siberian Army Corps, and on the same day delivered a vigorous attack in force on the Tenth Corps at Sanping. On the 27th and 28th of September, 1904, they made a demonstration against the Tenth Army Corps, and on the following day they attacked the Seventeenth Army Corps. Again, on the 30th of September they threatened the First and Seventeenth Army Corps, and at daybreak on the following day they delivered a severe attack on the Tenth Army Corps.

In the attack the Japanese advance by successive fractions of an extended line; their supports follow, similarly extended, 100 to 150 yards in rear. When in close-order formations under artillery fire the Japanese deploy at once.

For example, during the fighting near Shanlantzu on the 3d of October, 1904, some of our shells burst over a column composed of two or three battalions. To our surprise, they extended so smoothly and rapidly that in one minute the whole column had deployed. An hour afterwards a number of scattered groups of infantry appeared from some trees close by. They doubled forward to some bundles of millet (kaoliang) stalks piled along their front and there lay down. Very soon they stood up and ran forward again, each man carrying a bundle of the millet, and lay down again some distance farther on. In this manner, by successive rushes, they succeeded in reaching the banks of the Shaho. They were opened out to 50 or 60 paces interval between men and hid behind natural cover or behind the bundles of millet stalks that they brought with them. They appeared at first to be lying still, but after careful observation we perceived that they were engaged in making trenches, and very soon they were all connected up and a long line of trench was formed, which they defended obstinately.

By this skillful method of advance the Japanese succeeded in bringing up their main body to within 800 yards of Putilov Hill without attracting our attention. Fortunately, we then discovered them from the position of the Thirty-third Elettski Infantry Regiment and brought an effective fire to bear.

On the 4th of October, 1904, we observed that about half a Japanese battalion had assembled in a trench that we had previously abandoned and which was directly in front of the Thirty-third Elettski Regiment. Here they hid themselves for about half an hour. Parties of them extended right and left of the trench, creeping along the ground, and began to dig; by evening their trenches extended from Shaho village to Shynsalensko Hill.

We once had an opportunity of closely watching an advance made by the Japanese against the front of the position held by the Thirty-eighth Alrofski Infantry Regiment.

They attacked in widely extended skirmishing order. The firing line advanced at the double for a short distance, lay down, and commenced to dig. Notwithstanding our extremely heavy fire, they again doubled forward, giving up their half-constructed trenches, and began to dig new ones. The supports then doubled forward and occupied the first trenches and completed them. Whe firing line advanced from the second line of trenches, these occupied by the supports, and the reserves then moved up into first line of trench. The advance continued by successive ru in this manner.

The Japanese make a very careful reconnoissance of ground which it is intended to attack. On the 30th of September we very clearly discern their various reconnoitering parties from Sh lantzu village. At 10 a. m. a patrol of about 30 infantry appe near Houchai village, and shortly afterwards an individual s crept down quite close to our firing line, keeping well under and making careful observations. Some men of the patrol in then intentionally showed themselves, fired a few volleys at lines, and hid themselves again, evidently in order to divert attention and to allow the scout to reconnoiter without being turbed. This went on all that day until 5 p. m.

The Japanese artillery almost invariably opens fire after th the enemy.

They utilize their infantry to draw the enemy's fire and to l the positions of his batteries; they then fix the positions of th own guns accordingly, usually by night.

They are very particular in providing cover for their guns, e if they are concealed from view behind a village or wood.

The Japanese artillery concentrates its fire firstly on the ene batteries, secondly on the troops, ammunition wagons, etc., in serve, and finally upon the ground in rear of the enemy's posi in order to prevent reenforcements being sent up.

They occasionally cease firing for a short time and then re with renewed energy. These pauses in the fire are apparently make us believe that we have got the true range and have caus them damage; during the cessation of fire the gun crews all ta cover under shelters or in a trench.

It is evident, from the accuracy with which they hit villag hills, etc., at almost the first shot, that the Japanese batteries provided with excellent maps.

The Japanese infantry fire is as a rule wild, but it is superior rapidity to ours. The Japanese infantry does not hesitate to ma night attacks, and in these cases they make great use of h grenades. It is impossible not to admire the bravery and acti of the Japanese soldiers; the latter is doubtless due chiefly to th light equipment and to their natural fondness for the offensive.

In this connection the following notes on Japanese tacti and Russian cavalry tactics from a document by Maj General Kartzov, commanding mixed Caucasian Coss division, captured June 16, 1905, at Liaoyangwopeng, m be of interest:

. The principal characteristics of the Japanese troops are as fol-
rs :

Careful and strict performance of outpost duties; a quiet and noise-
s advance when assuming offensive; precautions when in action
guard against surprises; quick decision at critical moments.

The points to which we should pay particular attention are as
llows:

1. RECONNOITERING.

It should be borne in mind that other things should be reconnoitered
sides merely the enemy's position. The general features of the
untry should, in particular, be carefully observed.

Reconnoissances should be pushed as far as possible against the
ont and around the flanks of the enemy's line, care being taken to
void being cut off.

When the enemy's patrols are encountered, it is unnecessary to pur-
ue them. More importance should be attached to fulfilling the par-
icular mission on which they have been sent. It is preferable to try
o decoy the enemy into an ambush, and every opportunity should be
mbraced of getting to close quarters with cold steel, as hand-to-hand
ighting is the weak point of the Japanese cavalry.

The outpost line must always be ready to fight at a moment's no-
ice, as laid down in the field service regulations, and under no cir-
umstances is retreat permissible. All outpost duties must be strictly
performed, especially at night.

Reports should not be sent by a single orderly; not only is there a chance of his being intercepted by the enemy, but he may also be set upon by the Chinese who are hostilely disposed to us. The line of pickets should be thrown out as far from the main body as possible.

2. The following points should be remembered with regard to tactics:

(*a*) *Against the enemy's cavalry.*—The Japanese cavalry has hitherto tried to avoid shock tactics against our Cossack cavalry; the only occasions on which it has charged having been when dealing with a very small detachment. In future, therefore, when encountering the enemy's cavalry it will be advisable to conceal your strength and to entice them to approach to close quarters, when shock tactics can be employed.

An advance in deep columns against Japanese cavalry is not recommended; it will be better in most cases to keep the main body under cover until the enemy advances sufficiently near to render a charge possible. As many prisoners as possible should be taken.

(*b*) *Against the enemy's infantry.*—If the enemy's infantry is taken by surprise, a sudden cavalry charge will undoubtedly be successful. In order to effect a surprise, the following points should be borne in mind:

(1) The real strength of the force should be concealed from the enemy as long as possible.

(2) Care should be taken to keep out of the effective ran enemy's infantry.

(3) Endeavors should be made to entice the enemy's infantry from the point which it is intended to attack.

(4) Foggy weather or darkness should be taken advantag

(5) Retirements in front of the enemy's infantry should be ca out in extended order, so as to minimize losses.

3. DISMOUNTED SERVICE.

During the war our cavalry has frequently fought dismo this has often been rendered necessary because the ground wa sufficiently open for mounted action. Dismounted service sh employed rationally as circumstances demand. Should the e cavalry adopt dismounted action or should his infantry be en tered, our cavalry must not hesitate to fight on foot also.

According to the experience gained by our troops, there is no much to fear from Japanese infantry fire as regards quality; b plenty of ammunition they are able to fire a great deal.

On the defensive, therefore, it is advisable to allow the enemy advance within 600 yards, and then to overwhelm him with a of bullets. The moral effect of this will be very great. When fi at long ranges, the target must be a large one, such as an encamp barracks, or reserves in close order. Even against such an obje it is useless to fire unless the range is accurately known. Otherw the only result is a waste of ammunition and the exposure of our tion to the enemy, which will call down a heavy hostile fire, a particularly from the enemy's artillery.

During the war the terrific and powerful effect of artillery fire h been most marked. Consequently troops should not be exposed un an opportunity presents itself.

The comments made by General Kuropatkin are convi ing testimony to the skillful tactical methods of the Japan and are fully substantiated by all the information wh could be gathered on the Japanese side. In reconnoiteri positions and in night maneuvers and attacks the Japan infantry displayed a remarkable efficiency which contrib largely to its success.

If I were asked to name the chief characteristic of t Japanese infantry, I should say that it was its tenacity. Ground once gained was rarely, if ever, yielded, even wh enormous sacrifices of life were involved. Time and ag during the war, when the advance was checked, the leadi troops would hold on under terrific and deadly fire for hours, sometimes even for days, without yielding an inch. Likewise, failures in assaults did not appear to dishearten th ldiers, who returned to attack at the word of command with e same apparent determination.

I have heard it charged that the Japanese soldier possessed e spirit of a fanatic. While some of his exploits may ppear to savor of fanaticism in their daring and determin-ion, his nerve, or, perhaps better, his lack of nerves, as vinced in his ability to hang on and stick it out for long eriods under heavy fire, reveals a spirit quite the opposite f the fanatic, to whom constant motion is essential.

Skillful in preparation, brave in execution, resourceful in mergencies, the Japanese soldier compares favorably with he soldier of any nation, if, indeed, he does not actually urpass him.

THE JAPANESE CAVALRY.

During the summer of 1905 I was fortunate enough to meet a number of leading cavalry officers of the Japanese army and to learn a few matters concerning the Japanese cavalry, of which the following notes are the result. At this time all the available Japanese cavalry was operating on the left front of General Nogi's army, its movements extending to a distance of 80 miles west into Mongolia.

The Japanese cavalry is organized normally into 13 regiments of divisional cavalry, each of 3 squadrons, and 2 independent brigades, each of 2 regiments of 5 squadrons, of which 4 only take the field, the fifth squadron being retained as a depot for training remounts and recruits. The divisional cavalry regiments bear the same numbers as their divisions. The First Brigade is composed of the Thirteenth and Fourteenth Regiments and the Second Brigade of the Fifteenth and Sixteenth Regiments. The two brigades perform the functions of corps cavalry, and are assigned to different armies, as circumstances require. In the operations before Liaoyang and the Shaho one brigade was attached to each of the flank armies. During and subsequently to the battle of Mukden both brigades operated on the left flank.

During the war a new cavalry regiment, the Seventeenth, was organized, but it is not known just where it was posted or when it arrived at the front. There were also organized 2 "independent reconnoitering detachments" of 2 squadrons each, whose organization and functions are not clearly understood.

The weakness of the Japanese in cavalry is forcibly sh by the fact that it constituted only about one-seventieth the entire field force in Manchuria, and this, too, in a coun eminently adapted to cavalry movements. In face of Russian superiority in cavalry it was about all the Japan cavalry could do to perform the needful duties of scouti reconnoitering, and contact without attempting to engage cavalry actions The Japanese squadrons were entirely t few and precious to be frittered away in charges, and th tactics were necessarily influenced and regulated by the co ditions of the war. In order to strengthen the cavalry br ades some of the squadrons of the nearer divisional regimen were generally added. While engaged in the siege of Po Arthur practically all the cavalry of the besieging army wa employed with the field armies in the north.

Owing to the exceptional conditions affecting the Japane cavalry in the war, its normal conduct has been defensive an its main reliance the firearm. The cavalry took the field wit but 36 rounds of ammunition for carbine, which was soon in creased to 150 rounds, and instead of replenishing from th nearest infantry ammunition columns, the brigades organize their own. By the adoption of defensive tactics, fighting o foot, and keeping more or less near an infantry support, th Japanese cavalry was able to hold its own and to perform th duties of scouting and reconnoitering with a fair degree of satisfaction. The numerous villages which dot the plains of Manchuria afforded excellent defensive points to cavalry acting on the defensive, for, once the cover of a village wa gained, it put an end effectually to mounted action by the enemy and gave the Japanese time in which to receive reenforcements or to make a dash for the next village in the event of the Russians dismounting to fight on foot.

A favorite scheme of the Japanese cavalry was to steer the Russian troopers against an infantry ambush, and the trick was frequently worked in connection with outpost and reconnoissance duties.

For some strange reason the Russian cavalry seemed unable to force issues at close quarters and, although outnumbering the Japanese cavalry 7 or 8 to 1, accomplished very little in the way of useful results for their side during the war. In discussing this question the Japanese cavalry officers are disposed to blame the Russian method of training cavalry which makes it more a mounted infantry than a true cavalry force and destroys the true cavalry spirit. Although compelled to adopt defensive action and to fight dismounted the Japanese cavalry officers believe in training cavalry primarily as such and not as mounted infantry. Such at least is the opinion of General Akiyama, the father of Japanese cavalry, who, in spite of the experience of the war, was an adherent of the arme blanche and shock tactics. Perhaps his opinion is influenced by the Japanese traditional fondness for the sword, which is called the "soul of the Samurai." But whatever the opinion as to cavalry training, shock tactics and mounted action were simply out of the question for the Japanese in the Russo-Japanese war, and the Japanese cavalry officers very wisely adapted themselves to the peculiar conditions and thereby rendered the best possible service.

There can be no doubt that Japan was heavily handicapped in the war by her weakness in cavalry and that many golden opportunities were lost thereby. Both at Liaoyang and Mukden Japan failed to reap the full benefit of her victories owing to the want of cavalry. At Mukden especially a well-trained corps of 10,000 sabers with some horse artillery would have been simply invaluable. One almost feels disposed to criticise the lack of forethought and prevision, usually such a conspicuous feature with the Japanese, in sending over half a million men to Manchuria with but 6,500 sabers all told, did one not know that there are extenuating, almost insuperable, circumstances. Japan is by nature a horseless country. Its dense population and intense cultivation leaves no room for such bulky live stock as horses or cattle and the pressing need of economy forbids dependence on mounts purchased abroad. The war practically exhausted the entire domestic supply of horse flesh, and one of Japan's chief difficulties lay in procuring remounts for cavalry and artillery. During the early spring of 1905 some Australian horses were purchased, probably because they were cheap, and some 500 were being trained at the depots in June, 1905. As these animals were unbroken and had on their winter coats when they reached Japan, it is doubtful whether the experiment would have been successful.

[illegible] per cent [illegible] There is no supply [illegible] as closely as [illegible] material [illegible] mainly [illegible] depend on the [illegible]

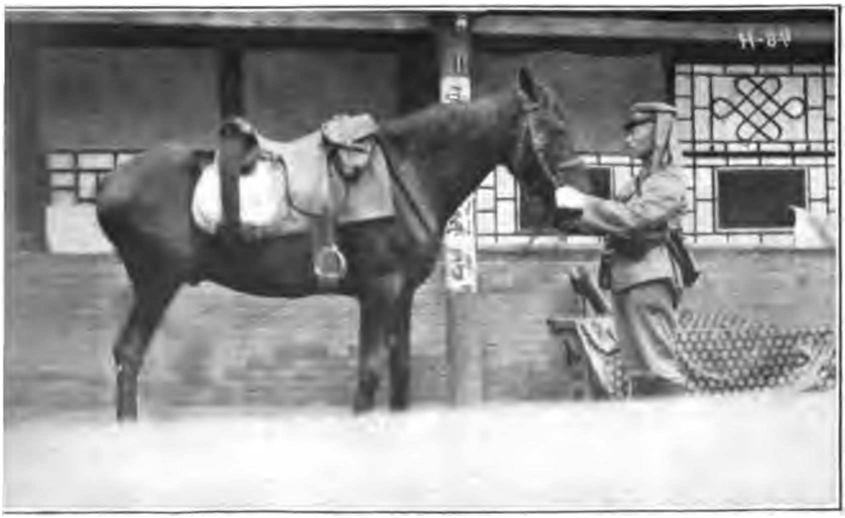
[illegible] purposes of [illegible] are held responsible. [illegible] commanded by Major-General Ak[illegible] spirit in the Ja[illegible] years old and has spent four years [illegible] quite fluently. He is an [illegible] and a fine type of the thor[illegible] professionally educated soldier with which [illegible] army abounds. He is, moreover, endowed with [illegible] personality, being genial, cordial, and affable [illegible] to the average Japanese officer whose [illegible] marked by reserve and taciturnity and an evi[illegible] conversation lest he reveal a military se[illegible]

The two colonels of the First Brigade, Koike and Taya[illegible] young men, 41 and 43, both in the prime of *life* and ex[illegible] active and vigorous. Colonel Koike also spent some years in France, and is a fine horseman. He is a go[illegible] type of the "beau sabreur" cavalryman, while Colonel Tayabi is rather more of the "brainy" type.

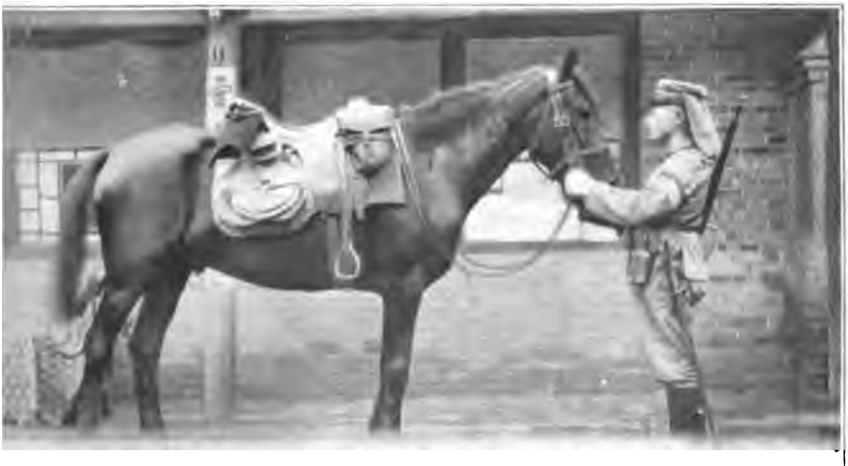
The Second Brigade is commanded by Major-General Tomura, a pleasant and agreeable officer above 50 years of age and of very small stature, even for a Japanese.

The cavalry is regarded as a sort of corps d'élite and the officers are from the best families, but brains are a primary requisite. In the training of officers long-distance rides and other competitions form a feature. The cavalry recruits are selected for their intelligence as well as for their conformation as future horsemen. No extra pay attaches to the cavalry service, but an allowance is made for shoeing and saddlery, and a horse is furnished. Most of the officers, however, own private mounts.

The soldiers are well instructed and all privates can read maps and are quite capable of taking care of themselves indi-



3. JAPANESE CAVALRY SOLDIER AND HORSE.



4. JAPANESE CAVALRY SOLDIER AND HORSE.

idually. The high intelligence of the Japanese cavalry soldier was noticeable.

The Japanese cavalry horse would hardly meet our standards. They are uneven, but for the most part light in the barrel and leggy, but notwithstanding capable of remarkable endurance. Japan is fully conscious of her weakness in suitable cavalry mounts and has for some years been engaged in improving the quality by establishing stud and brood farms and encouraging the peasantry. The results of these measures are already becoming apparent in some of the mounts, mostly officers, seen in the field.

The remounts required in a year's campaigning amounted to about 50 per cent, drawn from the horse depots of the army to which the brigades were attached and from local purchases and capture. Great efforts were made to capture Russian horses, both because they were better than the average Japanese animal and because of Japan's limited resources in horse flesh. The hardest work for the brigades occurred during and subsequent to the battle of Mukden, when the horses averaged 15 miles per day for forty days, being given plenty of food.

The cavalry is armed with saber and carbine, the latter slung on the back by its sling and the former hung from a waist belt. The carbine sling must be tight to hold the weapon firm, and this produces an objectionable pressure on the chest. The carbine breech (also the infantry rifle) is generally kept wrapped with cloth to keep out the dust, which is very frequent and troublesome in Manchuria. Japanese cavalry officers differ in their opinion as to the lance. Some believe in it for its moral effect. Some officers even favor a bayonet for firearms for night work.

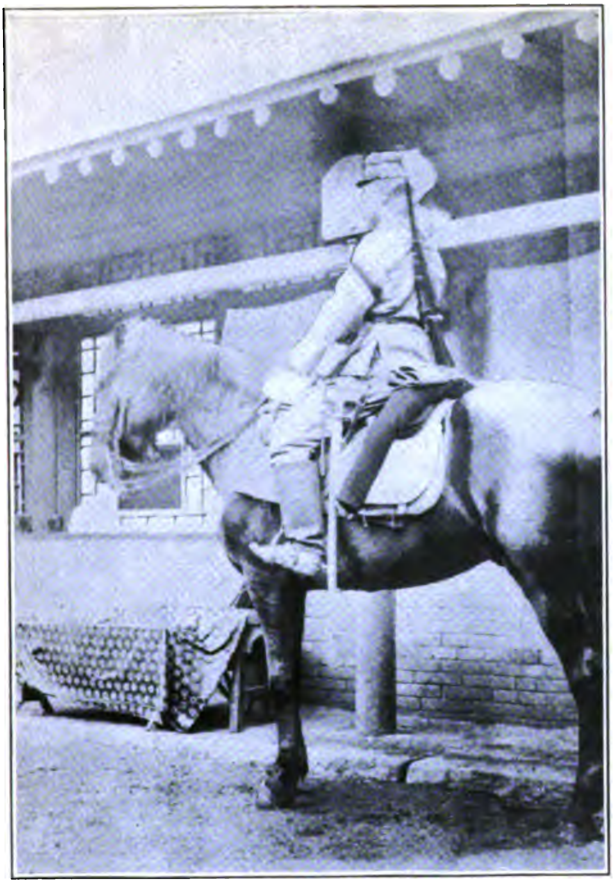
The men's saddle is rather heavy for its size, but made of excellent material and wearing well. It has detachable pommel stuffed with wool, no burrs in front, and with short fantails. The kit is carried in detachable wallets and saddlebags. Two blankets are carried, and the overcoat is rolled and strapped. The entire kit is simple and serviceable. The saddle stirrups are of metal, which make them cold to the feet in winter and hot in summer. They are frequently wrapped in cloth.

An inspection of six squadrons in June, 1905, showed [illegible] and [illegible] may be safely concluded that the men's saddle is a [illegible] article of equipment. The officers' pattern is smaller and lighter than that for the men, and from my own experience, [illegible] sore backs [illegible] of stiffness in the arch which permits of pressure on withers. Fifty per cent of the horses with officers' saddle accompanying the second group of attachés on its route from Lin[illegible] to Ha[illegible] came in with sore backs. The march was an extreme one, taking thirteen days, of which four were days [illegible]. The two horses with American saddles on this march came in sound and whole, although one of them had exceptionally high and thin withers. Many cases of sore backs from officers' pattern saddle developed during the campaign among the horses ridden by the attachés. But if defective in construction, the officers' saddle was quite comfortable, as I can testify after nine months' continuous experience.

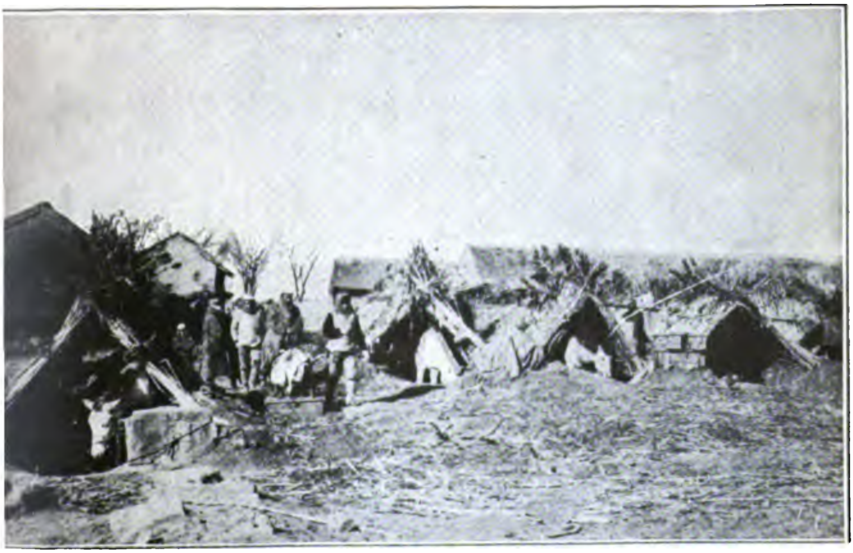
The stable management is bad, the horses being fed and watered twice a day on an iron-clad system regardless of the conditions of work. The Japanese justify this practice on the theory that the horse must accustom himself to hardships of service and that too much "nursing" is bad. It must be admitted, however, that the condition of the Japanese horses was good at all times, notwithstanding. They are tough and hardy naturally and accustomed to "hard picking" all their life, and accordingly do not require as much care as finer-bred animals.

Stabling is provided in summer time by improvised huts of light spars lashed with rope and inclosed with the universal kaoliang matting. In winter sunken huts are provided. Owing to their pawing and generally restless nature the standings in the improvised stables become bad very quickly.

The main grain ration is barley, fed unhulled and uncrushed. This seems to be difficult of digestion as shown by the grains in the horse manure. Long forage is fed only sparingly, and the horse's craving for such food was illustrated by his greed for any and all substitutes. Hard and unappetizing as they must be, the dry kaoliang stalks, preserved by the Chinese for fuel, were greedily eaten, as were



5. JAPANESE CAVALRY SOLDIER AND HORSE.



6. JAPANESE WINTER STABLES, SHAHO.

also the rice straw matting in which grain and other supplies are packed. I have seen horses tied to building walls tear these to pieces to get at the kaoliang stalks upon which the mud is plastered. Trees within reach of the animals were invariably barked.

During the latter part of the war Australian compressed fodder—a mixture of hay, whole oat stalks, and a little bran—and California baled hay were also issued in small quantities. Some millet straw was also purchased locally and fed with kaoliang grain and beans or bean cakes, the straw being chopped up in Chinese fashion. In the matter of feeding the Japanese learned much from the Chinamen whose live stock, in spite of extra hard work, was always in prime condition. No infectious or contagious diseases appeared among the Japanese horses during the war, showing that they are hardy and tough.

The shoeing of the cavalry horses is looked after carefully. Cold shoeing is employed on the march and hot when in camp. Veterinarians accompany the brigades, one with each regiment and one with the horse hospital with the train detachment.

The cavalry horses can hardly be said to be well broken or the men to ride well, although they do ride fearlessly. Officers as a rule show a good seat and have nice mounts. Normally there is no artillery with the brigades, but for the war an improvised horse artillery battery was organized for each brigade from captured Russian guns.

Machine guns were also added to the cavalry after the outbreak of the war, there being six to each brigade, divided into sections of two guns under one officer. Sections may be attached to squadrons as required. The guns are used primarily for defense and their fire reserved for short and mid ranges.

A general impression seems to prevail that the Japanese cavalry was a very negligible quantity in the war and that its quality does not merit serious consideration. Both impressions are not only incorrect, but unjust to a very zealous, earnest, and efficient branch of service in the Japanese army. Considering its numbers, the achievements of the Japanese cavalry are nothing less than wonderful, and the fact that it was not utterly wiped out of existence by the immensely superior force of Russian horsemen should be convincing evidence of its ability.

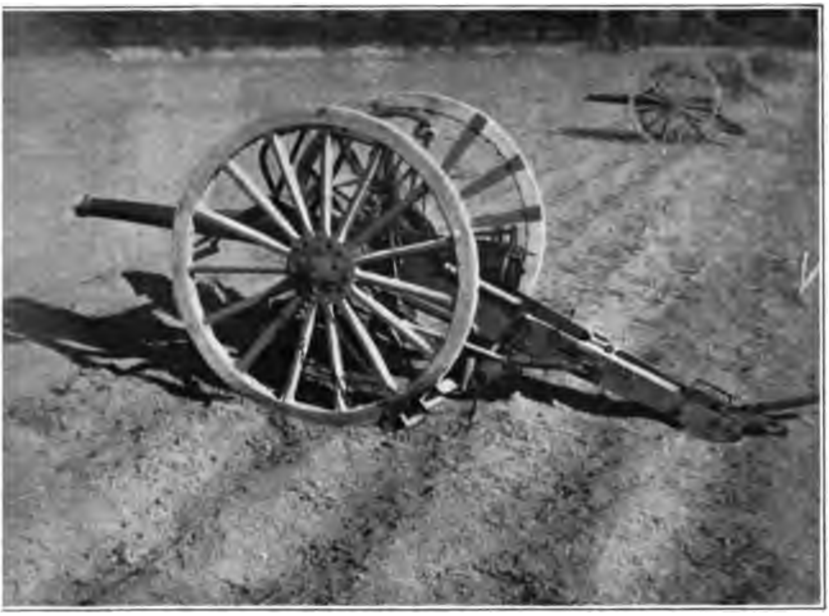
To one who has been privileged to form a closer acquaintance with the personnel of the Japanese cavalry it is not difficult to understand how the latter maintained its own against the enemy. The high character and intelligence of officers and men, who were actuated by a keen spirit and earnest zeal, went a great way toward compensating for deficiency in numbers.

During January and February preceding the battle of Mukden the Japanese cavalry dispatched a number of patrols to the rear of the Russian lines to reconnoiter and to damage the railway line. So effective were the results of these patrols that the Russians became considerably perturbed over the safety of the railway and made new dispositions of their cavalry. It is claimed, and with some show of reason, that the withdrawal of his cavalry by General Kuropatkin to protect the railway line just before the battle of Mukden greatly facilitated General Nogi's turning movement.

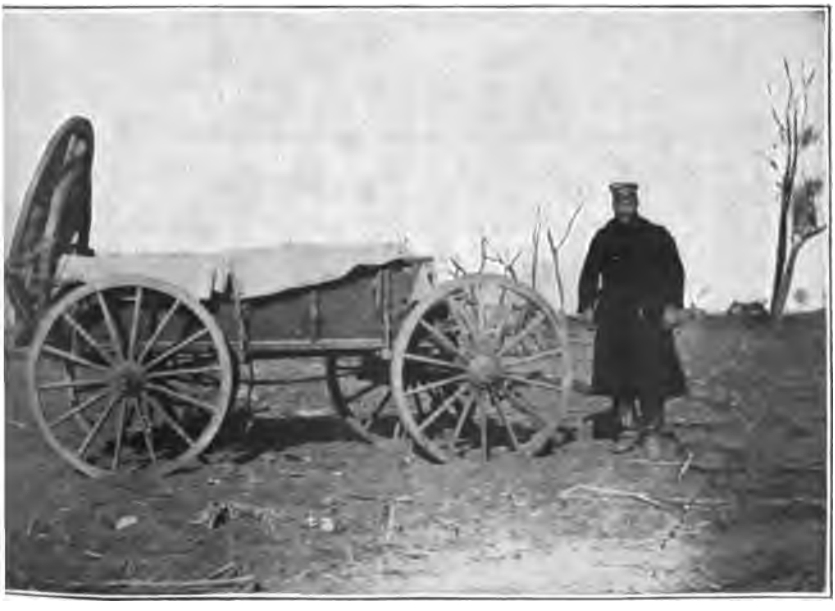
THE JAPANESE ARTILLERY.

In what follows it is not proposed to enter into any details of the construction of the Japanese field and mountain guns, which are already known to the War Department, but to confine myself to some notes on the organization and tactics of the artillery as observed in the war.

In the regular organization 1 regiment (6 batteries) of artillery, field, or mountain guns, belongs to each division. This proved true except for the Seventh Division, which had but 4 batteries (2 field and 2 mountain) upon its arrival at Port Arthur in November, 1904. The following shows the kind of artillery accompanying the different divisions in the field: Guards Division, 6 field batteries; First Division, 6 field batteries; Second Division, 6 field batteries; Third Division, 6 field batteries; Fourth Division, 6 field batteries; Fifth Division, 6 mountain batteries; Sixth Division, 6 field batteries; Seventh Division, 2 mountain batteries, 2 field batteries; Eighth Division, 6 mountain batteries; Ninth Division, 6 mountain batteries; Tenth Division, 6 field bat-



7. JAPANESE FIELD GUN.



8. JAPANESE BATTERY WAGON.

ries; Eleventh Division, 6 mountain batteries; Twelfth ivision, 6 mountain batteries; Fourteenth Division, 6 field atteries.

Besides the divisional artillery there were 2 artillery briades, each of 72 field guns. One of these brigades was ttached to the Third Japanese Army and the other to the Second and Fourth Armies, being shifted from one to the other as circumstances required.

Until after the battle of Mukden the Japanese had in Manchuria only their 13 line divisions and a certain unknown number of Kobi brigades. The organization of the Kobi brigades calls for 1 battery of artillery and 1 squadron of cavalry, but I never saw either artillery or cavalry with the Kobi brigades in the Second or Third Armies. The Kobi brigades were held as general reserves for the armies, and all information concerning their numbers was carefully guarded; but from the best information available it does not seem that there could have been more than 1 or 2 such brigades in each army, with perhaps several additional held in reserve by Marshal Oyama.

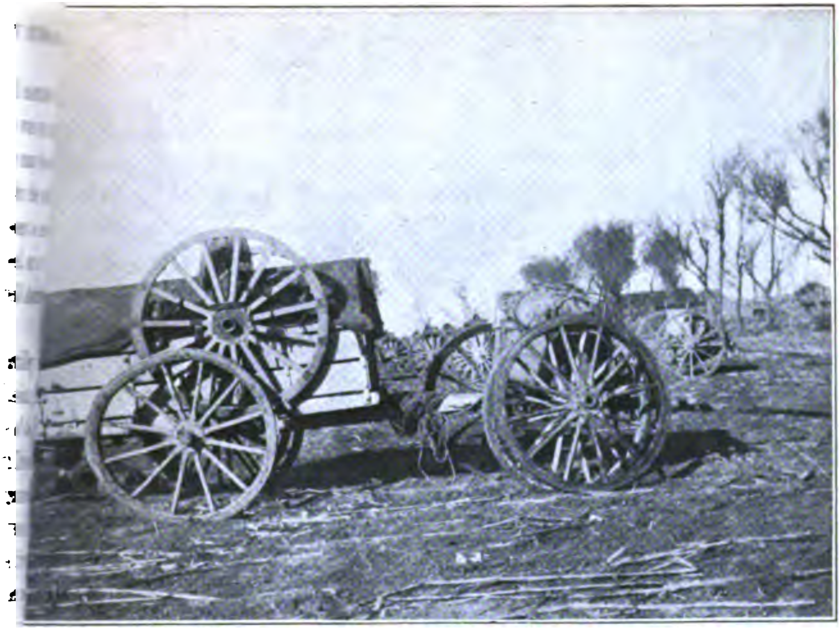
Leaving out of consideration the Kobi brigades, whose artillery complement, if any, would be small, the Japanese had 600 pieces of field artillery all told, of which 192 were mountain guns.

Besides their field artillery they also possessed a complement of 15-cm. and 12-cm. howitzers, horsed, and a complement of 9-cm. field mortars, transported on handcarts. These howitzers and mortars were organized in batteries of 4 pieces. The distribution and number of these pieces could not be ascertained beyond the fact that the Port Arthur army has 16 15-cm. howitzers, 28 12-cm. howitzers (4 knocked out), and 24 9-cm. mortars in its siege armament. Part of the howitzers had been used at the crossing of the Yalu by the First Army and then sent to the Third Army. All the field howitzers used at Port Arthur were sent north, and were presumably used in the battle of Mukden on some part of the front. Field howitzers and mortars also accompanied the Second Army during the battles of Liaoyang and the Shaho, and it is known that 32 such howitzers and mortars, mostly the latter, were posted and used at Liaoyang. The Japanese called these howitzers and mortars their heavy artiller Port Arthur this ordnance was in charge of fortress ar organizations, and the same may be assumed to have be case in the field armies. On the advance to Liaoya 9-cm. mortar section was seen a number of times o march. The mortar is of steel, on a wooden platform very much like our 3½-inch field mortar, the caliber be trifle larger.

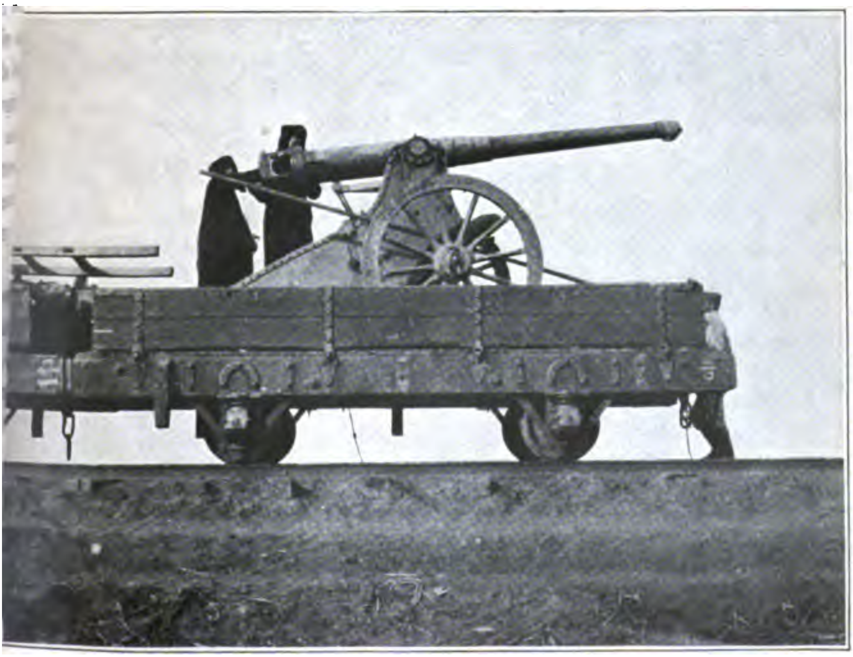
Besides their field and heavy artillery the Japanese al ganized a number of captured Russian guns into batterie 6 pieces. Thus, during the battle of the Shaho, at leas such battery was used by the Sixth Division, and it was derstood that others were also organized later from g taken in that battle. The Ninth Division had a battalio 3 batteries of Russian guns organized from the trophie Port Arthur. Probably there were other batteries organiz in the other armies of which I have no knowledge. Up and including the battle of the Shaho the Japanese had c tured about 150 Russian quick-firing field guns and a f amount of ammunition. Many of these guns, however, we minus some essential part of the breech mechanism, whi had been removed by the Russians before abandoning th pieces. One difficulty complained of by the Japanese officer in utilizing the captured guns was their weight and the in ability to procure horses of sufficient size and strength t horse them satisfactorily. Two Russian batteries were al used during the battle of Mukden by the cavalry divisio operating on the left flank of the Japanese army, being em ployed as horse batteries.

Four 10.5-cm. siege guns, captured at Nanshan, were used by the Japanese during the battles of Liaoyang and Shaho. They were transported on push cars along the railroad and always emplaced close to the railway track, as it was impracticable to transport them across the fields. These guns were presumably also employed during the battle of Mukden.

Allowing 14,000 combatants to a Japanese division and estimating each of the four field armies up to the battle of Mukden as having 2 Kobi brigades aggregating 12,000 combatants, the total number of combatants would be about 230,000. Considering only the Japanese field artillery, the proportion of guns works out to about 3 per 1,000 combatants



9. JAPANESE BATTERY WAGON.



10. RUSSIAN 10.5 CM. GUN TAKEN AT NANSHAN AND USED BY JAPANESE AT LIAOYANG AND SHAHO.

The mountain guns, which form about one-third of the Japanese artillery complement, are sighted to 4,300 meters only and have an effective shrapnel range of 3,700 meters. The field gun is ranged to about 5,500 meters with an effective shrapnel range of about 4,500 meters. Contrasting this with the Russian field gun, which is ranged to 6,400 meters and fires a 15-pound shell as against a 11-pound Japanese shell, it will be evident that in the matter of material the Russian artillery had a decided advantage over that of the Japanese. As regards the number of pieces possessed by both sides, it was generally understood that the Russians also had an advantage. In one particular only did the Japanese artillery possess an advantage, and that was in the matter of a high-explosive shell, of which the Russians had none, or, if they did, never fired any to my knowledge. This advantage turned out to have been a most important one and went far toward maintaining a balance in the artillery equipment of the belligerents. The Russians being nearly always on the defensive and occupying fixed lines with artificial or natural cover, the high-explosive shells of the Japanese artillery rendered service to their cause to a degree that is little appreciated. The material and moral results of high-explosive shells found frequent illustration, both at Port Arthur and in the field battles. Village walls and houses ceased to afford safe cover, and the trenches in the rocky soil of hilltops, while not so vulnerable as villages, must have been very trying to the defenders' nerves under the accurate high-explosive-shell fire of the Japanese. Against material cover of even the slightest kind shrapnel fire is practically powerless, and when fired with uncut fuse the shell can do no more than perforate a small hole in a wall.

The Japanese high explosive shell is charged with picric acid, which gives off a huge volume of dense, black smoke on explosion. Occasionally shells failed to explode, but would break up on stony soil, scattering the explosive about and staining the ground an intense yellow. The importance attached by the Japanese to high explosive shells may be judged from the fact that they formed from one-fourth to one-third of the ammunition carried.

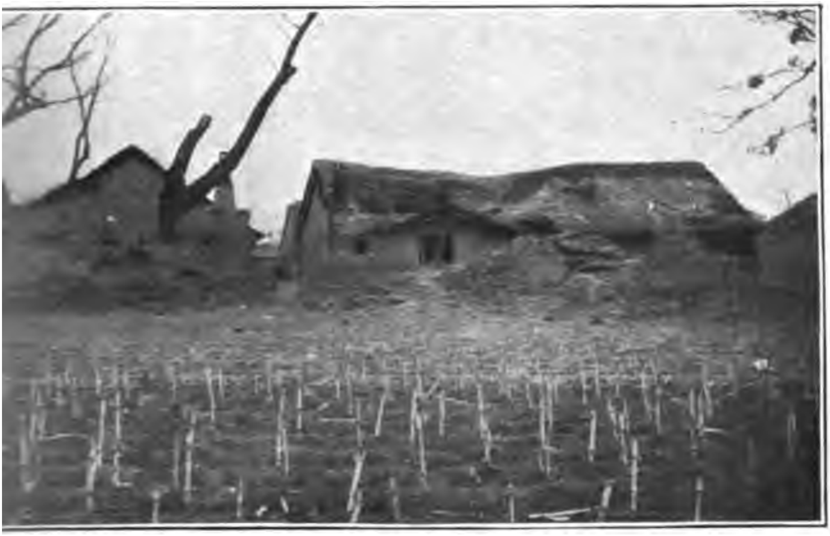
The Japanese gun was in no sense a quick firer. The ammunition is separately loaded, the powder charge being contained in a brass case. The gun limber recoils on its wheels after each shot, being automatically returned part way into battery by the tension of a spring operating through a wire rope carried from the spring around the axle to a brake shoe under the wheels. Some assistance must be given by the gunners in order to secure full return into battery. This is effected by two men, one on each side, who seize the wheels as the limber begins to move forward under the action of the spring and by their efforts complete the return into battery. On account of the heavier work required in the service of the artillery the soldiers for this branch of the service are selected from the taller and stronger recruits.

The Japanese mountain gun is carried on pack ponies, of which five are required per gun. One pony carries the gun alone, one carries the upper part of the trail, which is in two pieces coupled by a socket joint, one carries the lower part of the trail, one carries two wheels and two boxes with powder charges, and the fifth pony carries two shell boxes each with 7 rounds. The smaller parts, such as shafts, handspikes, etc., are distributed among the four ponies not carrying the gun. The pack saddle used throughout the army is employed with the addition of a light iron cradle to carry the gun and trail pieces. With the saddle the horse wears a harness by means of which the gun when assembled may be drawn about. The gun can be knocked down and loaded or unloaded and set up, in less than three minutes.

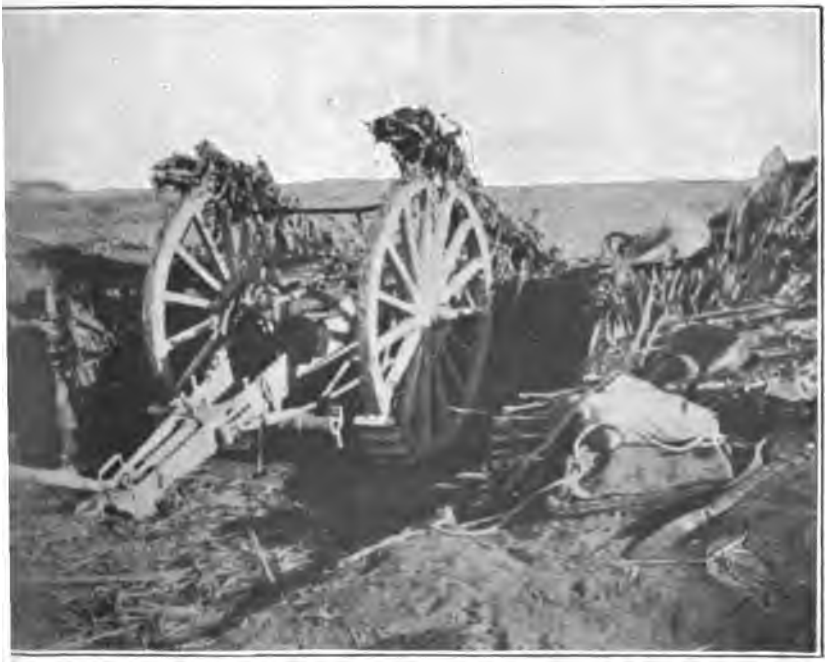
Each artillery regiment has 2 ammunition columns, each of 136 Japanese carts, providing 150 rounds per gun. The shells are transported in wooden packing boxes holding 9 each, 4 boxes to 1 cart.

Each battery carries with it 130 rounds, 40 rounds in the gun limber and 45 rounds in each of the caisson limbers. The regimental reserve, 70 rounds per gun, is carried in 24 caissons. The total number of rounds per gun, carried with battery, regimental reserve, and ammunition column, is 350.

Tactically the Japanese handled their artillery with great skill and daring. Guns were massed and fire concentrated upon the objective of attack. Thus, at Liaoyang, the fire of 180 field guns and 32 howitzers and mortars was brought to bear on the Shoushanpu position during August 30 and



11. WALL AND HOUSES BREACHED BY JAPANESE HIGH-EXPLOSIVE SHELL.



12. JAPANESE FIELD-GUN EMPLACEMENT, SHAHO.

1, 1904. In the attack on Chaohuatun, March 7, 1905, by he Ninth Division, 108 guns were brought to bear on the Russian position. In the attacks on the outlying Russian ositions at Port Arthur similar tactics were brought into lay. In the attack on Shihliho, October 12, 1904, 72 guns ore on this village. In every case of this kind the Japanese rtillery was overwhelmingly superior to that of the Russians, who, notwithstanding their superiority in artillery as whole, never seemed able to bring but a small part into ction at threatened points. The Japanese, having the nitiative, could bring their artillery to bear where they leased, whereas the Russians, being on the defensive, were nder the necessity of dispersing their guns along the entire efensive line.

Being outranged by the Russian guns, the Japanese were nder the necessity of getting in pretty close to the Russian ines in order to make the fire of their artillery effective. But aside from this necessity the Japanese artillery leaders howed great daring in the way in which they pushed up their guns and supported the infantry. At Port Arthur the field rtillery was generally pushed up to within 1,500 yards of he Russian works, while at Chaohuatun on March 7, 1905, the artillery was gradually pushed forward, as the attack developed, to 1,800 yards from the village. At Tungchangshang, March 10, 1905, two batteries were pushed into Kuoshantun, from whence they shelled the Russians at a distance of only 400 yards. The infantry attack was always supported up to the last moment by the artillery, which did not hesitate to fire over the infantry for this purpose.

The shooting of the artillery was very good, and it seemed to have no difficulty in ranging its guns. The accuracy of the Japanese artillery was commented upon by both Generals Kuropatkin and Stoessel, the former in his paper on Japanese tactics, which appears under the subject of the Japanese infantry, and the latter in conversation with General Nogi while discussing terms of capitulation at Port Arthur.

In selecting gun positions great attention was shown in the matter of concealment. Much of the firing was indirect, being controlled from an observatory on a near-by eminence or from a tree top. At Liaoyang, during the attack on the

Shoushanpu position, the Japanese artillery took up its p
tion in the fields of kaoliang, which had at this time rea
its maximum growth, the fire being directed by obser
located in tree tops, house tops, or on stepladders car
by the batteries and of sufficient height to enable th
servers to look over the top of the kaoliang. During
attack on the inner lines at Liaoyang the fire of the
artillery position was controlled by observers on the su
of Shoushanpu, about 1 mile to the left rear of the posit
Observers are provided with large telescopes or hyp
and have telephonic conection with the batteries. Wher
natural concealment exists artificial concealment is prov
if possible. During the battle of the Shaho much of
kaoliang had been cut and shocked, and the Japanese util
these shocks for concealment.

During the battle of Mukden, when the fields were utt
bare, the guns of the artillery brigade of the Third Ar
were provided with improvised shields of light plate wi
the gunner's seat. These shields were shrapnel proof a
although small, afforded fair cover to the gunners, who h
to maintain a crouching position owing to the lowness of t
gun. As digging of gun pits was impossible in the fro
soil, the batteries also carried a supply of sand bags wi
which to construct epaulments, filling them with frozen
scraped from the surface of the ground. Village walls a
afforded good gun positions, the guns firing through p
while the houses afforded cover for the teams and ammu
tion wagons.

The Japanese artillery, besides showing skill in conce
ing their gun positions, regulated its fire with a view
deceiving the Russians. If the Russian shrapnel co
menced to get the range and to burst near the front
rear of a Japanese battery, the latter would cease fire. a
if it had been found, and the Russians would hold the
range and pound away uselessly on a line several hundr
yards short or over. When the Russian batteries cea
the Japanese would resume. If by any chance the Russi
got the correct range the Japanese would continue firi
regardless of losses until the Russians altered the rang
These tactics were personally noted during the prelimina
artillery attack on Shihliho, October 12, 1904.

ll the foreign observers were of one accord in their mate of the Japanese artillery, which rendered a most ellent account of itself during the war. Although outssed in its material, and probably in quantity also, it only held its own, but showed a marked superiority r the Russian artillery. This result was due entirely the skillful and daring manner in which the artillery s handled. That it accomplished great material results testified by the statistics of the Russian casualties, which ow about 20 per cent due to artillery. At Port Arthur e Japanese also suffered heavily from the artillery, which s responsible for about 20 per cent of the casualties, but the field battles their losses from artillery appear to ve been less. The only authentic statistics which I was le to secure are those of the Second Army at Liaoyang, here the casualties due to artillery amounted to 6.99 per nt.

TECHNICAL TROOPS.

THE JAPANESE ENGINEERS.

The following notes on the organization and equipment f the engineers are largely the result of an inspection of ne Sixth Battalion made on September 28, 1904, by auhority of the headquarters of the Second Army. The attalion was at this time quartered in a village on the ight bank of the Taitzu River, about 4 miles northwest rom Liaoyang.

In time of war the engineer battalions are organized into hree field companies, a field telegraph section, and a bridge olumn. Each field company consists of 5 officers and 220 nen, with a pack train, without cart or wagon transporation. The horses of the pack train are in charge of train oldiers, who are not included in the numerical strength of the company. According to the statement of a staff officer, there are 25 pack animals in the company train, but a company officer of engineers stated that there were 30. Of these, 13 carry engineer tools and material, while the remainder carry the heavy baggage. Each engineer battalion has its regulation quota of medical officers and hospital corps men.

The field companies all perform the same class of that is, they are all competent to perform dem bridging, roadmaking, surveying and mapping, etc. railway or balloon organizations were met with in field, but when any special technical work arises, su operating searchlights, such work is put in charge of engineers. Thus at Port Arthur the military balloon the searchlight outfits were in charge of the engineer diers attached to the engineer park.

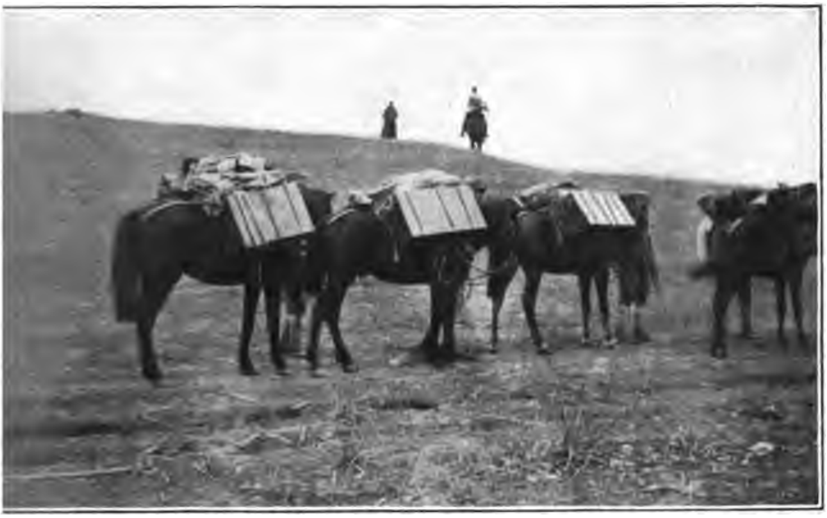
Normally the engineer battalions are under the di command of their respective division commanders, altho they may, on occasion, be directed from army headquar

The equipment and uniform of the engineer troops is same as that of the infantry, excepting only the tools carr on the person and the number of rounds of ammunition. T pickaxes and shovels are long handled, and, as a compen tion for the increased weight, the men carry but 90 round ammunition in the belt, instead of 120, one of the front car tridge boxes being omitted. The distinguishing color of t engineers is a reddish brown.

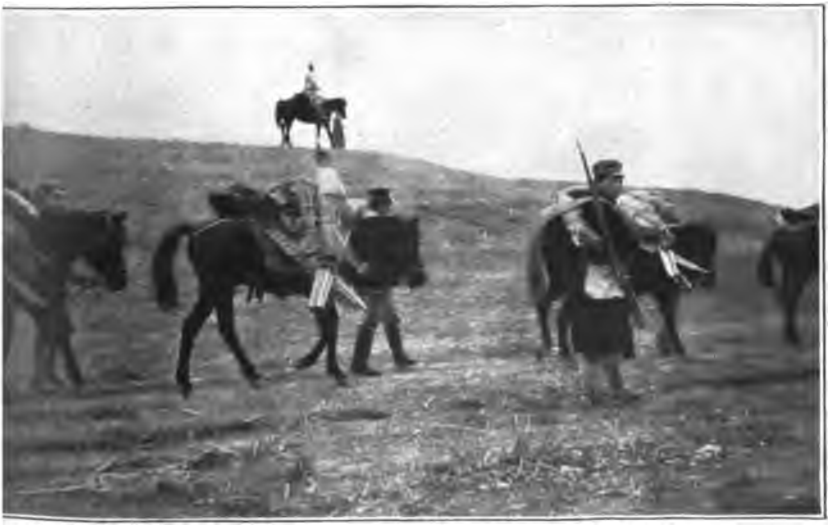
The engineer recruits are obtained from the annual draft by selection, the minimum height being 5 feet 4.42 inches; i other words, about 1½ inches more than for the infantry. The men must be “ handy ” men, able to read and write well and good at arithmetic. Of those selected, one-twentieth must be suitable for smiths, one-sixth for carpenters, one-fift for boatmen, and the remainder for telegraph or railway work.

The annual instruction of the battalion for the first year includes:

1. Individual instruction.
2. Gymnastics.
3. Musketry, preliminary drill.
4. Estimating distances.
5. Firing with reduced charges.
6. Digging, revetting, fascine and gabion making.
7. Drill in small squads.
8. Rifle practice.
9. Company drill.
10. Bayonet exercises.
11. Packing and loading tools and stores.
12. Construction of field works.
13. Field exercises.
14. Swimming and rowing.
15. Pontoon and other bridge construction.
16. Battalion drill.
17. Military roads.
18. Construction of redoubts.
19. Maneuvers.



13. PIONEER PACK TRAIN, SHAHO.



14. PIONEER PACK TRAIN, SHAHO.

During the second and third years the work of the first ear is repeated and sapping and surveying practiced.

For the higher education of engineer officers there is a chool for artillery and engineers at Tokyo, to which junior fficers are detailed for a normal one year's course.

The distribution of the tools among the personnel of a ield company, as witnessed during the inspection of the Sixth Battalion, is about as follows:

By whom carried.	What carried.	Number per company.
oncommissioned officers.	1 clasp knife, 1 notebook, 1 10-meter tape	....
rivates	1 jointed cross-cut saw	6
Do	1 hatchet, 1 chisel	5
Do	1 billhook, 1 hand-saw with detachable blade	6
Do	1 ax with detachable handle	30
Do	1 pickax with detachable handle	60
Do	1 shovel with detachable handle	90
Do	1 hatchet, 1 ship's auger	10
Do	1 bull's-eye candle lantern, folding, brass	....
Noncommissioned officer.	50 meters tracing cord, chalk line	....

The small tools, also the ax blades, are carried in leather cases and strapped to the soldier's pack.

Besides the tools carried on the person, the company pack train carries additional tools of the same kind, as well as all the special tools and materials.

Of five pack ponies exhibited, three carried tool boxes and two, long-handled tools and sundries.

The tool boxes are all identical—2 feet 4 inches long by 1 foot 3 inches wide by 7 inches deep over all. They are made of wood about five-eighths inch thick, covered inside and outside with thin sheet metal and painted dark gray. The box has a hinged cover with two hasps, and two short chains riveted to the bottom for slinging to the pack saddle.

The contents of the six tool boxes shown were as follows:

No. 1: Carpenters' tools, such as hand hammers, chisels, planes, ship augers, pincers, chalk lines, saws, adze, squares, whetstone, wire nails, etc.

Nos. 2 and 3: Blasting material, mainly explosives and Bickford fuze. The explosive was of two kinds—dynamite sticks, 1 inch diameter and 5 inches long, and cubes or blocks of Japanese "yellow powder," undoubtedly a picrate. Each piece of explosive was wrapped in oiled paper. Each box contained about 50 pieces of explosive, mostly "yellow p der," weighing, it is judged, 30 to 40 pounds in the agg gate.

No. 4: Blasting apparatus, consisting of two reels of in lated wire, Breguet exploders and electric fuzes.

No. 5: Wire (light galvanized, about 0 gauge), iron d folding siege lanterns, sickles, side-cutting pliers, adjusta level, jointed saw, rope, monkey wrench, billhooks, etc.

No. 6: Surveying outfit, consisting of folding trip plane table, compass, collimeter, hectograph, etc.

Each box is marked on the outside to show the nature of contents, while inside each, on the cover, is a drawing sho ing contents and method of packing the box. The boxes ar simply hooked to the pack saddles by their chains with lashings of any kind. When so hooked up, the lids are and hinges down, so that a box may be opened without tak it off the pack saddle.

The two pack horses loaded with long-handled tools car ried loads as follows:

No. 1: Eight shovels (4 each side), 8 pickaxes (3 one si and 5 on the other), 1 maul, and 2 canvas packages contai ing (*a*) billhooks, chalk lines, wire cutters, and (*b*) coil o galvanized wire and iron dogs.

No. 2: Twenty shovels, 8 pickaxes, 4 axes, and 4 long powerful, two-handed wire cutters.

The average load per pony is 165 pounds. The axes hav their blades incased in a netting with straw edge for the cut ting edge of the blade.

No information was given concerning the total number o tool boxes carried for each company, but on one occasion during the battle of the Shaho, an engineer company pa train contained 9 ponies, each with 2 tool boxes, and 4 ponie and 1 steer with long-handled tools, from which it woul appear that 18 tool boxes constitutes a company outfit.

The long-handled tools carried by pack animals are sup ported by a simple iron loop 3 feet long and 5 inches wid made of five-eighth inch round iron, with 2 short loo chains. The tools are inserted into the loop, handles dow equally divided between the ends of the loop. The handles o the two bunches of tools are crossed and held by a diagona lashing which is fastened to the ends of the crossbar of th saddle, so that the weight of the tools tends to spread the two bunches apart, thus jamming them against the ends of the loop. The loop with tools is simply hooked to the saddle by the chains without other fastenings.

The pack saddle is identical with that in general use throughout the Japanese army, described under the "Japanese transport and supply system."

Generally speaking, the engineer equipment in the Japanese army is characterized by its simplicity and its adaptability. Tools and supplies are reduced to the lowest limits possible, both as regards variety and quantity. The mistake of attempting to provide for every possible contingency that might arise and loading down transportation with a lot of useless plunder has been studiously avoided.

So far as could be learned no special outfit of blacksmith tools was carried into the field by the engineers, and in one instance at least where blacksmithing work was required in the construction of a bridge the work was done by native smiths. Field forges accompany the train battalion of the division, and these afforded all necessary facilities for doing such blacksmith work as became necessary.

Iron dogs were used exclusively as fastenings for heavy timbers in bridge work and, in my judgment, are far superior to bolts for work in the field, saving both time and tools. Their more general adoption in our engineer service merits earnest consideration.

The principal duties of the engineer troops with the field armies during the war were limited to bridge building, road construction, building redoubts, and demolitions, and these kept them reasonably busy. The flat plain of the Liao is intersected by numerous streams of varying sizes, having steep banks and sandy bottoms.

The Taitzu River below Liaoyang and the Liao are unfordable. The remaining streams can generally be forded except when in flood, care being taken to avoid the quicksands with which these streams abound. Excepting the railroad bridges there are no others in Manchuria, the native carter depending upon the fords or ferries, of which latter a few are maintained on important roads. Under such conditions many military bridges were required, and the Japanese engineers generally showed great skill in this class of work.

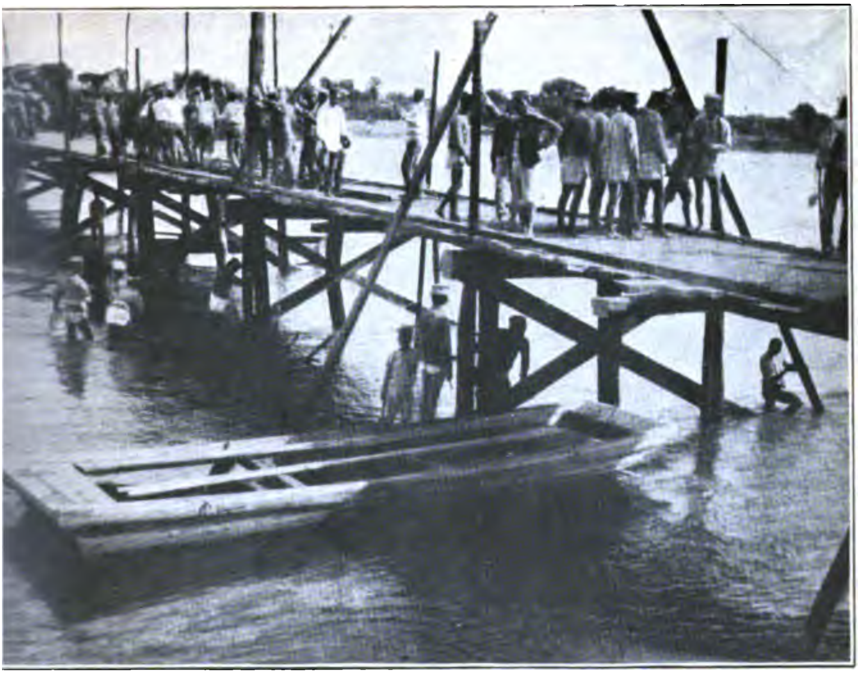
Where available, the Chinese junk, which was eminently adapted to the purpose, was employed to construct ponton bridges. On the smaller streams, where junks could not navigate, pile bridges were constructed, using the only available timber, viz., the cottonwoods and willows, of which a few grew in villages and about the ancestral tombs.

At least six bridges were thrown across the Taitzu River after the battle of Liaoyang, five across the Hun, and eight across the Liao, besides many others across the smaller streams to the rear. The bridges mentioned by no means cover all that were built, but merely those of which there is personal knowledge. Of the numerous bridges constructed by the Japanese engineers of the Second and Third Armies several typical forms are shown on Plate II and by the photographs herewith.

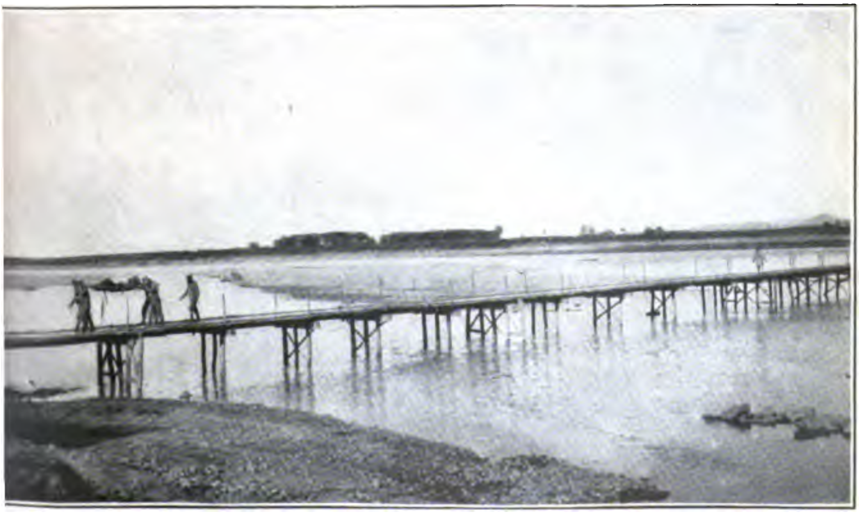
The bridge at Kaiping, shown on Plate II, was intended for foot passengers and horsemen only, and was of *light* construction. The trestle bents were about 20 feet apart and braced transversely by inclined piles. A *detached* and braced fender pile was placed upstream to ward off floating débris. Four steel rails served as stringers, *supporting* the planking, which was held in place by side rails and rack lashing. There was no longitudinal bracing other *than* that afforded by the stringers which were wired to the trestle caps.

The Taitzu River bridge (A, Pl. II) was likewise *intended* for light traffic only, including Japanese pony cart. Every fifth bent was braced in the manner shown in the cross section. Intermediate bents were either entirely unbraced or provided with the simple 2 by 4 inch diagonals. The hand rail was of simple wooden posts, spiked to the cap, with two running cords of light wire rope.

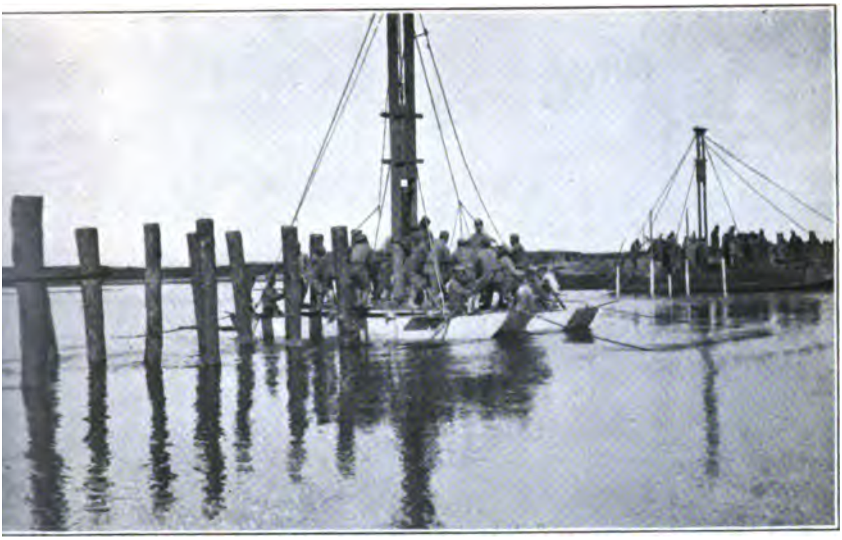
The Haicheng River bridge presented a unique example of the adaptation of steel rails and wire in bridge building. The trestle bents were spaced about 25 feet apart and braced by diagonals. A steel rail was then driven vertically alongside the outside piles of the bent and spiked to those piles by ordinary railway spikes. Inclined rails were driven in the plane of the trestle bent and wired to the vertical rails. The six steel rails used as stringers were trussed by two 2 by 10 inch plank supported under the middle of the stringers by wire cords running to the tops of the vertical steel rails.



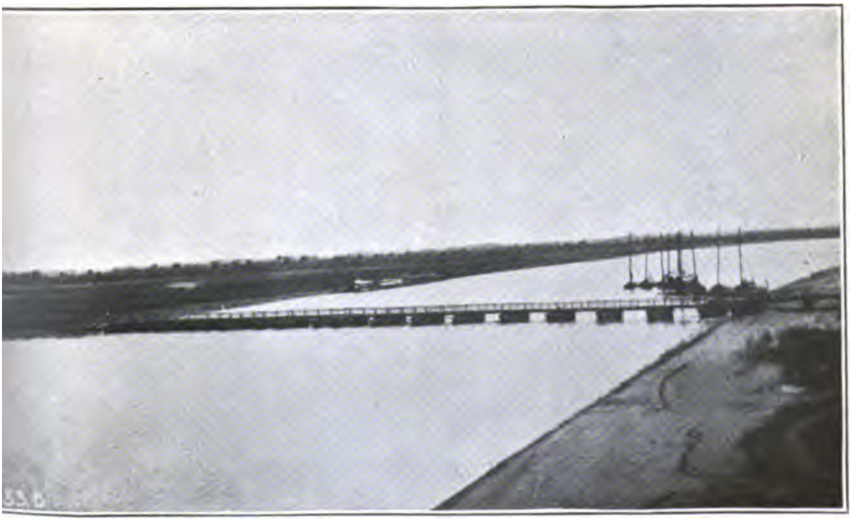
15. BUILDING BRIDGE ACROSS HAICHENG RIVER.



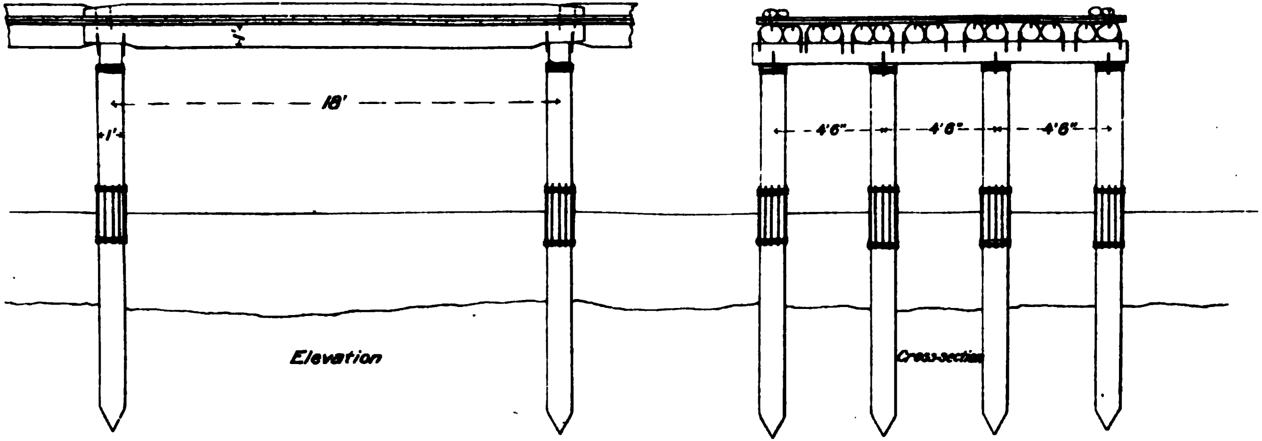
16. BRIDGE OF FIRST ARMY ACROSS TAITZU.



17. JAPANESE ENGINEERS BUILDING TRESTLE BRIDGE ACROSS THE TAITZU.



18. JAPANESE PONTOON BRIDGE ACROSS LIAO AT HSIAOTATZU.



Taitzu River Bridge B

Joseph E. Kuhn,
Major of Engineers

PLATE II

The bridge is 145 meters long, and it took one company of ngineers five days to complete the structure.

The Taitzu River bridge (B, Pl. II) was a strongly built restle bridge, designed to carry the heaviest wheeled loads. The piles are protected at water line by a ring of iron bars laid longitudinally and held in place by wire. This bridge was built during September, and the protection of the pile against floating ice and débris required consideration. The piles were wrapped with wire at the top to protect them while being driven. The seven stringers were of round logs dressed flat to secure a bearing on the caps. Stringers, caps, and piles were all strongly fastened together by iron dogs, as shown in the drawing. The planking was doubled, each layer being about 1½ inches thick. It will be noted that the bridge is without transverse or longitudinal bracing of any kind, reliance being placed altogether upon the rigidity and strength of the iron-dog fasteners to keep the bridge from yielding. This bridge was built about 50 yards downstream from the railroad bridge and almost on the same line as the Russian trestle bridge, which had been destroyed by fire on the retreat from Liaoyang. The length of the bridge is about 150 yards, and it took one company of engineers a full week to build the structure, after materials had been delivered on the ground. Pile driving was done by ringing engines, mounted on rafts, or Chinese junks or Japanese pontoon boats, there having been a total of seven engines, each operated by from 22 to 24 men. Just a year later, while returning from the front, this bridge was observed to have been carried away, probably by the breaking up of the ice in the spring. The photograph herewith shows the bridge in progress of construction.

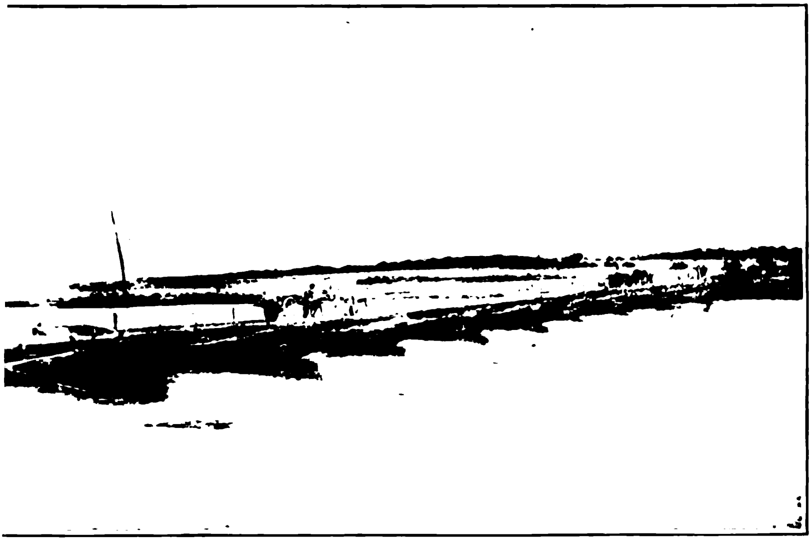
As an example of a pontoon bridge, those crossing the Liao at Hsiaotatzu and Shihfossu have been selected. They are sufficiently shown in the photographs and need no further description. The one at Hsiaotatzu was built leisurely by the First Battalion of Engineers during the summer of 1905 to replace an earlier bridge at the same place. Like all the bridges across the Liao, it has a draw span, in this case 11 meters wide. The Chinese junks were so well adapted for use as pontoons that they were nearly always employed in preference to trestles. These junks are very stanchly [illegible] and of sufficient buoyancy to afford a stiff bridge for the heaviest loads. As the current in the Liao is very [illegible] every junk was anchored upstream, downstream anchors being employed every second or third boat.

Until the battle of Mukden the Russians made no attempt to permanently damage the railroad, simply contenting themselves with burning the wood floors of the bridges as they [illegible]. At Anshantien and at Liaoyang the floors of the bridges were thus destroyed, and it devolved upon the engineers to relay the same.

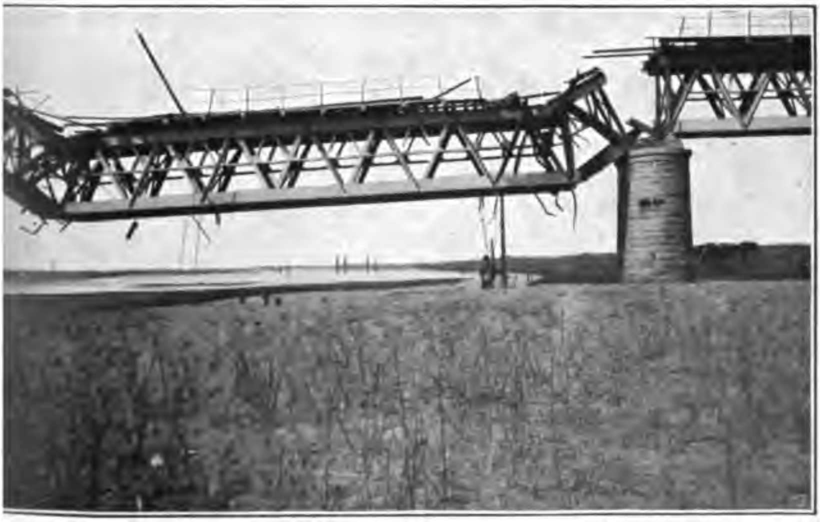
As bridge builders the Japanese engineers displayed skill and adaptability in utilizing the scanty resources afforded by a country like Manchuria. Their work was neat though light, sufficient for the ends in view. Their work, however, like all the operations of the Japanese, was characterized by deliberation and slowness. As an illustration the case of the Hun River railroad bridge may be cited. This bridge consists of 25 riveted spans, each 120 feet. On the 10th of March, 1905, the Russians effectually wrecked three spans, rendering the bridge useless for railway purposes. Instead of attempting to repair the railway bridge, the Japanese built an entirely new low-level bridge alongside, using plate girders supported by trestle bents and grading up at each end to the existing railway embankment. This work required six weeks' time and was done by the railway employees. The repair of the existing railway bridge could have been effected very simply by cribbing up from the shallow river bed (one damaged span was over dry land), and I am confident that with American troops the railway would have been in working order across the bridge in less than one week. The appearance of the damaged bridge two weeks after the battle of Mukden is shown by the photographs herewith.

Upon my return from Manchuria the damaged railway bridge had been repaired by heavy timber trestlework and the temporary bridge abandoned. A similar procedure was adopted in the case of the wrecked bridge at Kaiyuan.

Notwithstanding the great amount of trestle bridge building accomplished, steam pile drivers were never employed, all work being done by hand. In fact, all the military operations of the Japanese suffered in respect to rapidity by the



19. PONTOON BRIDGE AT SHIHFOSSU.



20. HUN RIVER RAILROAD BRIDGE, BLOWN UP BY RUSSIANS MARCH 10, 1905.

failure to appreciate the benefit of doing things on a larger scale and using labor-saving machinery. In making the criticism due allowance must be made for national character and financial limitations.

Ferries were also occasionally employed to cross the Liao. These consisted either of a raft, made by lashing together two junks, or of the specially built Chinese ferryboat. Both types were operated by sculling.

During the summer of 1904, while attached to the Second Japanese Army, there was little road building done. In a few cases especially bad spots were ditched or cut out by a new road through the fields. During the summer of 1905, while attached to the Third Army, much road building and improvement were accomplished in the sphere of operations of that army in the country about Fakumen. The topography is rolling and hilly and the ground much cut up by nullahs or ravines, which latter generally contain the roads, the soil here being sandy and gravelly, and consequently firmer. In wet weather, however, the alluvial character of the soil and the numerous nullahs and ravines intersecting the roads render them all but impassable.

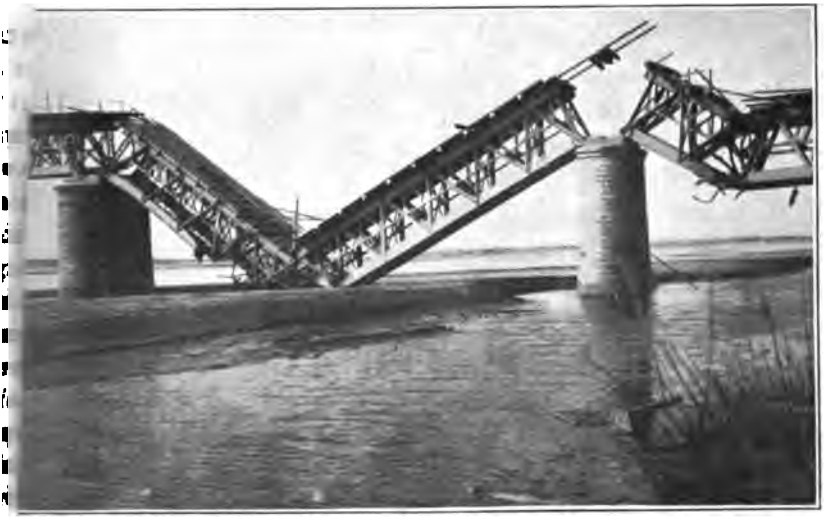
To remedy these conditions the Japanese improved the existing roads from Sanmiencheng, on the Liao, to Hsiaotatzu, via Fakumen, and the one from Tungchuangkou to Fakumen. The improvements consisted generally in ditching and draining the existing roads and in providing bridges over the worst crossings. Several low and marshy spots were corduroyed, but the scarcity of timber prevented any general application of this system of improvement. Beyond Hsiaotatzu the road crosses marshy ground for a distance of nearly 3 miles to Sanchiatzu. Here the engineers built a road in embankment from 3 to 4 feet above the marsh and put on a top dressing of several inches of broken stone obtained from the bluffs on the right bank of the river at the bridge. The sides of the embankment were stepped and revetted with hurdles, the whole making a substantial piece of work. This road was not completed until August, 1905, and was the only piece of good road seen in Manchuria.

No one who has not actually seen and traveled over the so-called Manchurian roads during the height of the rainy season can form any adequate idea of their wretched condition. The numerous boggy spots and quagmires element of danger and call for the exercise of con watchfulness on the part of the traveler. Even weather the thin crust of apparently firm soil overly quagmire frequently gives way and precipitates the rider. Under such conditions it can be readily un that such feeble measures as ditching and draining no adequate remedies. During the height of the rainy all wheeled transport ceased, and the troops were dep upon pack transportation for securing their supplies.

During battle the engineers were employed strictly a batant troops for the removal of obstacles and demol Thus at the attack of the Shoushanpu position a detach of 60 engineers from the Third Battalion opened their row gaps at the eastern end of the ridge, losing 7 men k and 31 wounded. At the western edge of the ridge, the Russian lines extended to the railway at a section a detachment of 80 engineers from the Sixth Batta under command of a captain, cut the wire entangle and engaged the Russians hand to hand. Only 10 me the detachment came out unhit. During the battle of M den the Ninth Battalion of Engineers demolished the inclosing walls of Santaitzu (just north of the Nor Tombs) and built emplacements for machine guns at K shantun for the attack on Tungchangshang.

In the construction of their fortified lines of resistance Haicheng, Liaoyang, and after Mukden, the engineers w called upon to do much work, building the redoubts, bo proofs, heavy gun emplacements, and constructing obstac

Owing to their limited equipment the engineer battali were unable to meet all the requirements in surveying a map making, and a considerable corps of civilian employe accompanied the headquarters for this purpose, being und the direction of the chief engineer of the armies. The civilian employees were uniformed like all other civilian em ployees at headquarters and were assimilated in pay to off cers, usually sublieutenants and lieutenants. Generally th engineer battalions surveyed and mapped positions and fort fications and the civilian employees the general topograph of the country. In the China-Japan war of 1894-95 the Japanese forces had occupied the country as far north a



21. HUN RIVER BRIDGE.

22. COUNTRY NEAR FAKUMEN, SHOWING NULLAHS CUT IN SLOPES BY RAIN.

Haicheng and appeared to have good maps, scale 1:50,000, of the territory occupied on that occasion. Beyond Haicheng the Japanese were dependent largely on the excellent Russian maps, 1:84,000. Much of the country west and northwest of Mukden had never been accurately mapped, and the Japanese surveyors were employed on this work, covering the country behind the outpost lines. The reproduction of maps for issue is made at army headquarters under direction of the chief engineer, sometimes by hectograph but more often by lithographic reproduction.

THE BRIDGE COLUMN.

Each division is accompanied by a bridge column which forms a section of the train and does not necessarily follow or accompany the engineer battalion, which is in no way responsible for its transport.

The column consists of 171 carts and wagons in charge of a train lieutenant and is accompanied by a detachment of engineer soldiers under a sublieutenant, which is responsible for the condition of the material. The train carries 32 complete boats and 8 trestles, sufficient for 144 meters of bridge. The train can be divided into four sections, each containing the material for 36 meters of bridge. The pontoon wagon is four wheeled, the front wheels being but 2 feet in diameter, so that they can cut under the wagon body in turning. Excepting the pontoons all material is carried on the standard Japanese cart.

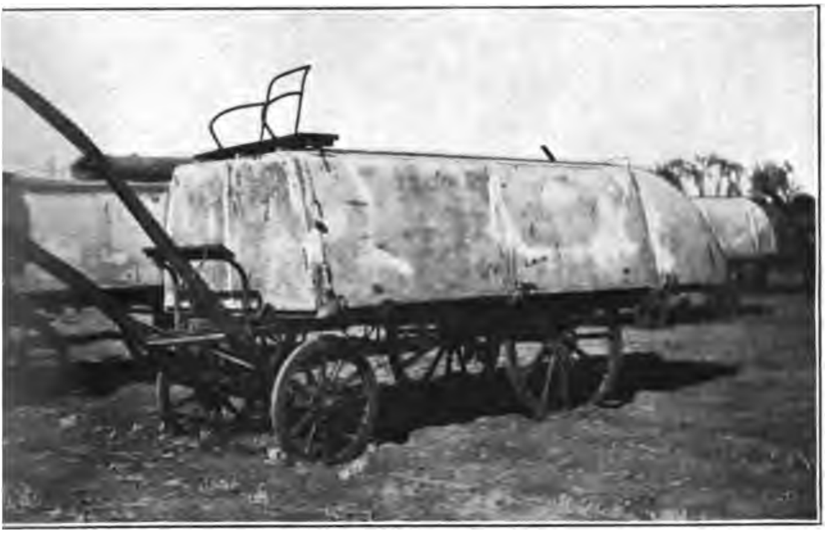
Sixty-four pontoon wagons are required to carry the pontoon halves, while 48 carts carry chess and balk, each the material for one bay. Eight carts carry 2 trestles each, and 16 carts carry each 16 floor boards for flooring the bottoms of the pontoons. About 8 carts are loaded with cable, abutment sills, anchors, paddles, tools, etc., while the remaining carts of the train carry luggage, rations, forage, etc.

The weight of a pontoon half is a little under 500 pounds, and that of the pontoon wagon (four wheeled) is also about 500 pounds, making the total weight over 900 pounds, being the heaviest load behind a single pony in the Japanese army.

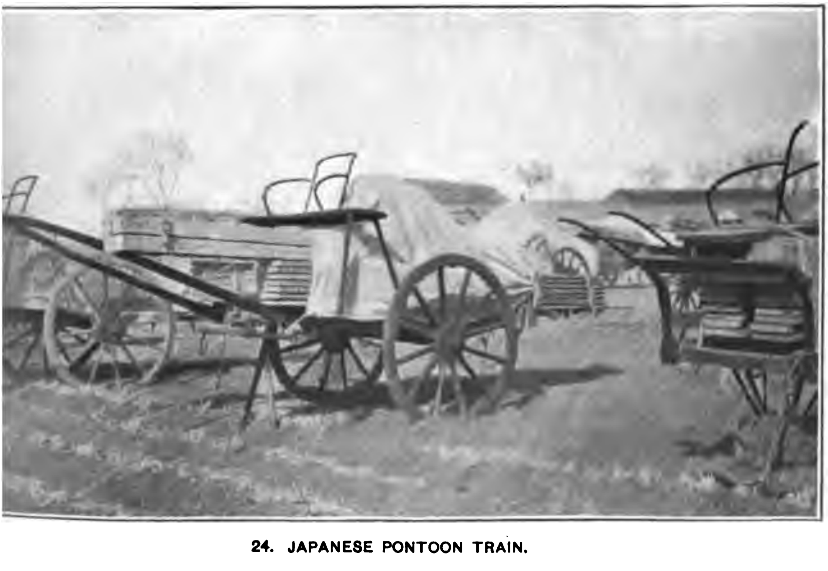
Each pontoon half is 12 feet long and consists of four pieces, the bow section, a mid section, an end section, and a bulkhead section. These are all separable by a system of packed joints forced together by cam levers. The width the pontoon boat is 4 feet 1¼ inches at top. 3 feet 2¼ in bottom. and 2 feet 3¾ inches deep. When the bridge is the pontoon has a free board of about 21 inches without. The pontoon is made of thin sheet metal. only 1 mm. t easily dented or punctured. Its lightness. however. per of ready repair in the field. for which the necessary tool carried. That the pontoons are frequently injured was ma apparent by the patches, of which many were noticed. T prevent the pontoon collapsing, each half is provided w three wooden thwarts or struts spread between the gunwa In transportation the pontoon half rests upside down on th thwarts. the driver's seat being fastened to the wooden clea screwed to the bottom of the pontoon, as shown in the photograph herewith. Each pontoon half is stiffened longitudinally by two ½-inch round-iron stanchions and two ½-inch round inclined braces attached to the wooden thwarts and angle-iron ribs. The joint packing is an ordinary strip of canvas and rubber. In making a boat two half pontoons are joined, bulkhead to bulkhead, by means of bolts and clevises, two on each side. Each pontoon half is provided with one hinged rowlock, two lashing rings, and two lashing hooks. the latter being fastened to the middle T bar at the bottom.

In constructing the bridge the saddle sill is laid across the thwarts, the recesses on the underside fitting over the nuts on the ends of the vertical stanchions, and lashed to the outer thwarts. On its upper side the saddle sill carries seven pairs of iron dowels which engage holes in the ends of the balk. There are nine balks to each bay, six for the floor, two for the side rails, and one for lashing transversely under the floor balks. The ends of the saddle sill have holes into which are dropped the iron stanchions, which support a light rope, the whole forming a hand rail. All the pontoon material is painted a light blue.

Like everything else in the Japanese equipment, the pontoon boat is excessively light—much too light, in fact, for the train and artillery of occidental countries. The idea contained in the design is, however, worthy of study, and it is believed that a metal boat can be designed sufficiently strong for our trains and equipment and considerably lighter than the present standard wooden pontoon boat.



23. JAPANESE PONTOON WAGON.



24. JAPANESE PONTOON TRAIN.

The ability to employ sectional boats of metal will enable he load of the pontoon wagon to be kept within such limits s to permit the bridge train to easily follow an army anywhere. The objection that metal boats can not be repaired n the field so easily as wooden boats should have but little weight with thin sheet metal which can be readily repaired by simple tools.

The Japanese boat possesses sufficient buoyancy to carry their artillery and trains, but not the Chinese cart. The division into small sections enables the boat to be carried by pack animals, and it is understood that the boat was so transported in the advance of the First Army through Korea. No examples of bridges with the Japanese pontoons occurred during the war in the operations of the Second or Third Armies, but the First Army on two occasions, at least, used their bridge equipment, once at the Yalu and once at Liaoyang, across the Taitzu.

SANITATION AND HYGIENE.

During the summer of 1904 practically every recognized principle of sanitation and hygiene was violated by the Japanese army saving two only, viz, the general use of boiled water and the wearing of abdominal bandages. This statement is made advisedly and with full knowledge that so-called experts have decreed otherwise in books and public lectures. The troops were regularly billeted in the dirty and vermin-infested houses of the villages, whose streets and compounds were nothing but reeking cesspools. No sinks were dug, the men defecating where they pleased in the fields adjacent to their quarters. The water supply was invariably derived from the village wells located on the edge of cesspools and not infrequently close to the village manure pile. In the hot, sultry summer the pest of house flies was something beyond description. In fact, all the elements for the development and spread of camp diseases were at hand, and yet the general health of the troops was excellent, and, saving beriberi only, the immunity from camp diseases was nothing less than astonishing. Some typhoid and dysentery were always present, but the percentage was remarkably small.

With the conditions so favorable for the development of enteric fevers it may well be questioned why the Japanese army enjoyed such immunity. Although a layman, I am impelled to offer the following thoughts or suggestions on the subject:

Manchuria has an undoubtedly healthy climate. The population is light and scattered, and, although the Chinaman himself is about as dirty and insanitary as it is possible for a human being to be, both personally and in his surroundings, the pastoral life offsets what would otherwise be a serious menace to health.

The long and severe winter helps to prevent the outbreak of epidemic diseases. For eight months in the year there is frost, and the warm weather is of short duration.

High winds, which prevail throughout the year, are also a factor in producing a healthy climate and in counteracting the miasmatic conditions that might otherwise become dangerous in the low, flat valley of the Liao.

Asiatics are undoubtedly less liable to enteric fevers than are occidental nations, whatever the reason may be. But aside from all climatic and physiological considerations there must be some weightier reason for the immunity of the Japanese troops from typhoid and dysentery under the conditions which prevailed in Manchuria. As in all other disciplined armies, the Japanese soldier receives instructions as to the preservation of his health and his handbook contains the sanitary rules and regulations, which are pretty much the same the world over. But it is one thing to prescribe a rule and another to enforce it, and right here, in my opinion, lies the key to the Japanese immunity from camp disease. The Japanese soldier can be fairly well depended upon to obey to the letter all rules and orders prescribed by his superiors. To this obedient spirit, coupled with the inherent virtues of cleanliness, sobriety, and simple diet, must be attributed the remarkable success of the Japanese in escaping camp diseases during the war. To credit these results to the superior excellence of the Japanese military medical organization is the sheerest nonsense, and yet this is exactly what certain enthusiastic and ill-informed writers would have the public believe.

The functions of the Japanese medical department are different from those in other armies. They do not exercise command except over their own medical personnel, and act in purely advisory capacity to the commanding officers. A good understanding, however, exists between the medical and combatant officers, and the advice of the former in regard to the health of the troops is generally heeded. In fact, it may be stated that the health of the troops is a matter of deep concern, not only to the medical department, but to every combatant officer and individual soldier, each of whom has had the importance of good health thoroughly impressed upon him.

In selecting camps the general line of the army is fixed by army headquarters and areas told off to divisions, brigades, regiments, and battalions. In selecting lines and camps the first object is always tactical, and no sacrifice of tactical efficiency is permitted for hygienic considerations.

While the dreadfully insanitary conditions surrounding camp life in 1904 were generally disregarded, a decided improvement in this respect took place in 1905. Inhabitants of villages were required to police their compounds and to drain their grounds and the roads under the supervision of the military police. Sinks were dug, both for soldiers and inhabitants, and maintained in a reasonably satisfactory condition. The general policing and cleaning up of the villages produced a marked effect upon the flies, whose numbers were perceptibly less during the second summer of the war, and improved the sanitary conditions beyond just criticism. In Fakumen many cesspools in streets and compounds were filled in with gravel and sand obtained from the dry river bed in the town, and public sinks built at street corners. By the close of the war this town, at least, had assumed a very creditable appearance.

All wells are examined as soon as practicable and marked as to potability. Aside from this, however, all water must be boiled (length not known) under standing orders. While this is generally done, instances of violation while on the march came under personal observation on several occasions, but such cases were exceptional, and the claim that the soldiers complied faithfully with orders on this subject seems well substantiated.

Boiling was at first effected in the camp kettles or in t mess tins of men detached from their company kitche Later a number of portable boilers and tanks rigged up o Japanese carts were issued. The boilers have a double wa around the fire box, to get the largest returns possible fro the fuel. When boiled, the water is drawn off into squar tanks of wood holding 20 to 25 gallons each, there being tw tanks mounted on one cart. The idea of the boiler is undoubtedly borrowed from the Russian traveling kitche many of which were captured at Mukden and used by th Japanese as water boilers.

Boiled water was always kept on hand at étape statio for the use of men passing over the lines of communicatio On main roads between army and division headquarters re stations were also encountered during the summer of 190 These stations were provided with boiled water, sinks an shade for the comfort and convenience of travelers.

The medical officer with advance guards examines an posts wells after rough examination. If wells are likely to be used for some time, samples of their water are analyze at division headquarters. The surroundings of wells in or near the more permanent camps were often drained and improved and covers put over the well hole. Sentries were als frequently posted at wells to insure their being kept clean, or, it may be, to warn off soldiers from particularly dangerou water.

Boiling was the principal reliance for purifying water. As no Japanese will drink water when he can get tea, it is not so difficult a matter to insure water being boiled before drinking as would be the case with American soldiers. Several types of field filters were seen at different times and places. These filters appear to have been more for test than for use.

The fact that suitable and seasonable clothing was issued to the soldiers also had beneficial effect on their health. This included abdominal bandage, mosquito head nets, and dust glasses. Cigarette smoking is general, and presumably is rather healthful than otherwise while campaigning.

During the second summer of the war barley was mixed with the rice as a preventive of beriberi, the object being to tain a more nitrogenous food. Just what results were complished by this can not be told until more detailed edical statistics become available. That there was less riberi the second summer than the first is certain, but hether this was wholly due to the barley diet or partly to e inactivity of the troops remains to be determined. reosote pills were also issued during the second summer, nd each soldier carried a little tin box of them and was pposed to take one after each meal. They are exceedingly le tasting, and if the Japanese soldier really followed his nstructions regarding the use of the pills he must be a ery faithful man indeed. The instructions on the box are ated to have been: "To beat the Russians take three aily," an ingenious appeal to the soldiers' patriotism.

Vaccination is compulsory and necessary, for smallpox s very common among the Chinese. Venereal diseases, hile common enough in Japan, are rare in Manchuria, or the simple reason that there are few loose women, and hese were kept under strict medical control by the Japanese urgeons.

As an item of interest it may be mentioned that the casualties from horse management in the armies exceeded those due to the bayonet, a convincing testimony to the viciousness of the Japanese pony.

Responsibility for enforcing sanitary rules rests with the battalion commanders, acting on the advice and in consultation with the medical officer. It seems to be taken for granted that the men will obey orders without close and constant supervision, and this is probably true of the Japanese more than of the soldiers of any other country. The effectiveness of supervision and enforcement of sanitary rules is judged by the health statistics of the units. The general good health of the Japanese army during the war was due not so much to supervision as to the teaching of the army as a whole the importance of sanitation, coupled with the earnest and sincere patriotism of the individual soldier. The lesson learned in the China-Japan war was taken to heart and bore good fruit in the Russo-Japanese war.

MEDICAL STATISTICS.

In drawing comparisons between the disease stati the Russo-Japanese and other wars there is a constant dency to contrast only typhoid and dysentery cases, to th sultant advantage of the Japanese medical methods. W this is true as far as it goes, it is not a wholly fair parison. Every race has its peculiar diseases, and the Japanese enjoyed a singular immunity from fevers, they suffered heavily from beriberi, a disease w rarely affects the white race. While beriberi was no garded as fatal, provided the patient was sent to Ja there to recuperate, it none the less affected the well of the Japanese armies to a considerable extent and sitated constant drafts of recruits to maintain the str of the field units. A transport captain at Dalny that during the summer of 1904 an average of 1,000 of beriberi were dispatched daily to Japan. While statement is, perhaps, somewhat exaggerated, it neverthe affords an index of the effects of sickness in the Japan armies and shows that they had their troubles in t respect.

As showing the casualties due to disease and wounds following statistics of the First Division at Port Arthur ar of interest:

	August.	September.	October.	To
Beriberi	313	856	335	[illegible]
Dysentery	4	67	129	[illegible]
Typhoid	0	25	119	[illegible]
Intestinal diseases and disorders	23	184	205	[illegible]
Other diseases	25	172	325	[illegible]
Bullet wounds	831	1,297	321	[illegible]
Bayonet and saber wounds	8	6	2	[illegible]
Shell wounds	489	709	241	[illegible]
Miscellaneous	124	204	61	[illegible]
Total	1,817	3,519	1,738	[illegible]

The high proportion of shell wounds as compared wit bullet wounds is noteworthy. The losses of the First Division were smaller than those of the Ninth and Elevent Divisions at Port Arthur.

The monthly percentages of sick in the Third Army dur ing the first seven months of 1905, as furnished by the chief medical officer, were as follows:

ary	9.04	May	6.79
uary	9.74	June	7.33
h	9.34	July	8.46
l	6.93		

he larger percentage during January, February, and ch arose from foot soreness due to shoes while marching n Port Arthur and during the battle of Mukden. The ease in sickness during June and July can not be charged nything connected with the war, since, even in ordinary rs in Japan, there is an increase of sickness during the mmer months. Thus for 1903 the percentage of sickness Japan for July and August reached 13+, or about 5 per t more than for July, 1905, in Manchuria.

The fact that the general health of the troops in Manuria was better than in Japan was remarked on several asions by Japanese officers. In the Second Army during e fall of 1904 statistics showed that the men had actually ined in weight notwithstanding the campaign. This may attributed, in part at least, to the more liberal and varied tion furnished in the field with its higher proportion of trogenous components.

The accompanying medical statistics of the Third Japanese rmy from June, 1904, to July, 1905, were kindly furnished y the chief medical officer of the army and may be regarded s official. Particularly noteworthy is the increased healthulness of the troops during the second summer and the ractical disappearance of beriberi. The high precentage f gun wounds, nearly 20 per cent of the whole, is also noteorthy. This high percentage is due no doubt to the seige f Port Arthur where artillery played so important a part. In the Second Army during the battle of Liaoyang the percentage of artillery wounds was but 7.99 of the total casualies, not differing materially from the results obtained in the Franco-Prussian war.

Noteworthy also are the heavy casualties of the Ninth Division, which had 22,938 killed and wounded during the war, amounting to 164 per cent of its normal combatant strength.

Statistics of sickness in the Third Army from the moment of its [illegible]ing up to the present time (June, 1904, to July, 1905).

	New patients.	Recovered.	Dead.	[illegible]
1904.				
June	506	339	4	
July	3,515	2,399	11	[illegible]
August	11,294	6,845	26	[illegible]
September	7,043	4,365	20	[illegible]
October	4,632	3,181	20	[illegible]
November	4,104	2,982	7	[illegible]
December	2,484	1,893	8	
1905.				
January	1,576	1,100	8	[illegible]
February	1,642	1,073	5	[illegible]
March	1,414	892	4	[illegible]
April	1,004	741	8	[illegible]
May	1,131	855	7	[illegible]
June	1,133	832	12	[illegible]
July	1,375	1,041	9	[illegible]
Total	42,853	28,538	149	[illegible]

In the above list total numbers of patients in the lines of battle and commissariat quarters are shown. Wounded are not included.

Patients classified by the nature of sickness.

FIELD DISTRICT.

	Total number of patients.	Nonepidemic.	Epidemic.		Beriberi.	Percentage.		
			Dysentery.	Typhoid.		Nonepidemic.	Epidemic.	Ber[illegible]
1904.								
June	489	433	2	11	43	88.55	2.66	[illegible]
July	3,295	2,209	124	30	932	67.04	4.67	[illegible]
August	10,985	5,483	360	14	5,128	49.92	3.40	[illegible]
September	6,690	4,096	109	13	2,472	61.23	1.82	[illegible]
October	4,424	3,171	268	81	904	71.68	7.89	[illegible]
November	3,938	2,997	59	71	811	76.11	3.30	[illegible]
December	2,396	1,922	12	24	438	80.22	1.50	[illegible]
1905.								
January	1,365	1,095	4	9	257	80.22	.95	[illegible]
February	908	776	2	8	127	85.46	.55	[illegible]
March	767	739	6	....	22	96.34	.78	[illegible]
April	617	586	3	9	19	94.98	1.94	[illegible]
May	647	609	4	11	23	94.13	2.32	[illegible]
June	592	550	8	8	26	92.91	2.70	[illegible]
July	853	788	15	18	39	92.38	3.05	[illegible]
Total	37,966	25,454	976	295	11,241	67.04	3.35	[illegible]

COMMISSARIAT DISTRICT.

1904.								
June	17	15	....	....	2	88.24	....	[illegible]
July	220	156	33	....	31	70.91	15.00	[illegible]
August	309	154	6	1	148	49.93	2.26	[illegible]
September	353	165	7	3	178	46.75	2.83	[illegible]
October	208	150	3	6	49	72.12	4.34	[illegible]
November	166	139	1	5	21	83.73	3.62	[illegible]
December	88	74	1	4	9	84.09	5.68	[illegible]

Patients classified by the nature of sickness—Continued.

COMMISSARIAT DISTRICT—Continued.

	Total number of patients.	Nonepidemic.	Epidemic.		Beri-beri.	Percentage.		
			Dysentery.	Typhoid.		Nonepdemic.	Epidemic.	Beri-beri.
1905.								
January	211	184	....	....	27	87.20	....	12.80
February	734	691	....	....	43	94.14	....	5.66
March	647	585	1	3	58	90.42	.62	8.96
April	387	355	....	3	29	91.73	.78	7.49
May	484	423	....	10	51	87.40	2.06	10.54
June	541	474	9	6	52	87.62	2.77	9.61
July	522	448	21	4	49	85.82	4.79	9.39
Total	4,887	4,013	82	45	747	82.12	2.59	15.29

Number of killed in battles (June, 1904, to July, 1905).

First Division	3,012
Seventh Division	2,951
Ninth Division	5,448
Eleventh Division	4,319
Auxiliary force of armies	3,637
Total	19,367

Statistics of the dead and wounded classified by the kind of wounds.

	Rifle wound.	Gun wound.	Bayonet wound.	Miscellaneous.	Untraceable wound.	Total.
First Division	8,163	3,101	61	1,277	918	13,520
Seventh Division	7,444	1,918	162	1,503	424	11,451
Ninth Division	14,998	4,399	80	2,001	1,500	22,938
Eleventh Division	7,809	2.409	120	2,268	1,697	14,303
Auxiliary force of armies	7,147	3,210	103	2,236	1,618	14,374
Total	45,521	15,037	526	9,285	6,217	76,586

	Percentage.				
	Rifle wound.	Gun wound.	Bayonet wound.	Miscellaneous.	Untraceable wound.
First Division	60.38	22.93	0.45	9.45	6.79
Seventh Division	65.00	16.74	1.41	13.11	3.47
Ninth Division	65.21	19.18	.35	8.72	6.54
Eleventh Division	44.60	16.84	.84	15.86	11.86
Auxiliary force of armies	59.72	22.33	.72	15.56	11.67
Total	59.44	19.63	.69	12.13	8.11

Statistics of wounds, classified by their severity.

	Severe wound.	Less severe wound.	Slight wound.	Total.	Percentage.		
					Severe.	Less severe.	Slight.
First Division	2,697	6,758	1,053	10,508	25.68	64.32	1.00
Seventh Division	2,323	6,092	85	8,500	27.33	71.67	1.00
Ninth Division	4,903	12,474	113	17,490	28.03	71.32	.65
Eleventh Division	2,948	6,619	417	9,984	29.53	66.30	4.17
Auxiliary force	2,441	7,879	417	10,739	22.74	73.38	3.88
Total	15,312	39,822	2,085	57,219	26.76	69.60	3.64

Number of field hospitals and wounded received by them.

	Hospitals established.	Total number of the wounded received by the hospitals.	Average number received each hospital.
First Division:			
Completely established	27	18,830	[illegible]
Partly established	6		
Seventh Division:			
Completely established	11	9,180	[illegible]
Partly established	13		
Ninth Division:			
Completely established	18	21,490	[illegible]
Partly established	4		
Eleventh Division:			
Completely established	15	12,035	[illegible]
Partly established	6		
Total:			
Completely established	71	61,535	[illegible]
Partly established	29		

In the above list only wounded in battle are shown. and [illegible] wounded Russians are included.

THE JAPANESE TRAIN BATTALIONS.

Each division of the Japanese army has a train battalion, which takes charge of all divisional transport except the ammunition columns, which are in charge of artillery soldiers, both the infantry and artillery columns. The train battalion is the nucleus and school of instruction for the entire system of divisional transport. The men serve with the colors for three years, and their principal duties in time of peace consist in training drivers, of whom four batches per year of about 120 each are given three months' training in handling the various classes of military supplies and in managing the transport ponies and carts. In this way a large reserve of transport or auxiliary train soldiers is formed from men too small or otherwise physically unfit for the line.

In time of war sufficient of these transport soldiers are called out to serve as drivers for the divisional trains and for duty at the landing bases and étape stations, thus avoiding any drafts on line troops, whose sole business is to fight. The wisdom of such course must necessarily commend itself to every intelligent mind. In time of war the train battalion is broken up to supervise the transport and the battalion organization ceases to exist. A mounted detachment of the attalion accompanies all transport columns, usually in the roportion of one train man to every eight transport soldiers. These mounted train men are armed with the carbine and act s escorts to their columns. The transport soldiers normally vear side arms only, but during the battle of Mukden it was oted that they had all been provided with captured Russian ifles, which were carried strapped to the cart seats.

No valuable information was forthcoming regarding the umber of train and transport soldiers required by a division n a war footing, and, as these were broken up into numerous mall groups or columns, no opportunity for counting or estinating presented itself. The mobilization table places the ersonnel of the train battalion on a war footing at three companies with an aggregate strength of 1,202. The noncombatnt strength of a division has been generally reckoned at over 5,000, including about 1,200 in the medical department. On this basis the number of transport soldiers per division would amount to about 3,000.

Besides the transport soldiers required for the divisional transport, many are called out for service along the lines of communication, at depots, base hospitals, etc. Thus 3,000 such soldiers were specially called out for general service at Dalny.

The entire transport and supply system is so organized that no demands are made upon the line troops, and the harmful system of detailing fighting organizations to look after the needs of the commissary and quartermaster departments, as practiced by us, is entirely obviated.

THE HORSE HOSPITAL.

Besides the veterinarians who accompany cavalry and artillery units, there is with each army a horse hospital which is under the jurisdiction of the army étape inspector. The horse hospital for the Third Japanese Army does not appear to have been organized until after its arrival at the north, and was first opened at Hsiaopeiho about the beginning of February. Later it was moved to Lanchiatun, near Mashanchiatzu, on the Hsinmintun highway, and still later it was moved to Wangchiawopeng, about 2 miles north of Fakumen. The following notes are the results of several visits to the hospital during the summer of 1905.

All veterinary matters on the army lines of communicati are supervised by a senior veterinarian having the rank major. The horse hospital was under the immediate charg of a veterinary lieutenant with 5 assistant veterinarians (civilians) and about 50 trained soldiers and farriers, with hir Chinese coolies as required by circumstances.

On the occasion of my first visit, July 7, 1905, there we 98 sick horses under treatment from the three divisions of t Third Army, mostly from the train. Besides the sick hors there were some 20 Chinese ponies, purchased at an averag of 245 yen per head by the Japanese Government for issu and some 25 cases of cured animals awaiting reissue. Th horse hospital is distinct from the horse depot of the divisions, which is in charge of a cavalry officer with an attendan veterinarian.

The sick cases are segregated, according to the nature o their illness, in paddocks of various sizes. There were mor cases of sore back, caused by the transport-cart harness, than anything else. The sick included several cases of wounded horses, one of which dated from the battle of Mukden— wound in the jaw from a shrapnel bullet—which had at firs healed and then broken out again.

The sick horses are fed 3 sho of barley and 1 kwamme of hay daily, less than horses at work. They are also taken out in small batches to graze along stream beds and edges of fields, but on the whole receive little grass or green forag considering the opportunities available at this season of th year. The horses are fed twice daily, in accordance with the Japanese system, with sometimes a little hay in between. Horses requiring special diet are fed crushed barley or bean mash. There is very little bran available, scarcely any wheat being grown in this part of Manchuria.

There were no cases of infectious diseases in the hospital. Horses are quarantined and inoculated for anthrax before leaving Japan, this disease being prevalent. Glanders are unknown in Japan, but occasionally cases occur among Chinese animals. Generally speaking, however, both Japanese and Chinese horses are hardy and not liable to disease. The Chinaman, moreover, is a good horse manager, and his animals are, as a rule, in excellent condition. Watering and feeding troughs in stable yards are of stone, exposed to sun and air, which is conducive to health of animals.

Cases of foot troubles requiring water treatment are tied in a pool of water just outside the village. Treatment for lameness is by fomentation, burning, and blistering, along European lines.

About two-thirds of the cases treated were stated to recover.

The patients looked fearfully thin and in poor condition, evincing lack of management and faulty feeding.

Farriers use hot shoeing and trim the hoof in the rough with a chisel and mallet. It was noticed that the frogs were trimmed. The Japanese horseshoe has fourteen nail holes, seven on a side, but only seven or eight nails are driven when reshoeing, leaving the vacant holes for nails which are driven in the field when the shoe becomes loose, a few nails and a shoeing hammer being carried in the wallets by each mounted man.

The horse hospital can be divided into five units if required. When the army is at a halt most of the veterinary work in cavalry and artillery units is attended to by the veterinarians attached to those organizations, but when the army has to move, sick and lame horses from the artillery and cavalry are sent to the horse hospital or sections of the latter sent forward to open branches.

One of the principal functions of the horse hospital was the castration of vicious animals who are either dangerous or unmanageable. Several operations were witnessed, and they were performed in a scientific manner. A bed of kaoliang or straw is first laid down and then covered by a canvas sheet. A disinfecting fluid is then sprayed over the sheet and surrounding ground from a tank. The patient is then brought alongside the bed of straw and a stout strap with iron ring buckled around each foot. A running rope is then passed through the four rings and the horse is ready to be thrown. A harness, consisting of belly band and crupper with a combination of webbing straps, is then put on. By suddenly hauling in on the running line the animal's feet are drawn together. A simultaneous pull on the webbing straps on the harness causes the horse to fall over on the bed of straw.

The upper hind foot is then released from the running rope and strapped to the harness at the shoulder. Meantime the horse has been blindfolded and a twitch applied. The parts are washed with soap and antiseptic solution before cutting. A German ecraseur instrument is employed in the operation. Castrated animals receive no dressing after operation. Their tails are tied up, and the flies irritate them dreadfully. They are kept in a cool, airy, mud house until recovery, which is in about a fortnight. Of a hundred cases of castration in a few weeks, there were no cases lost.

Notwithstanding indifferent horse management, the natural hardiness of the Japanese animal, never taxing them beyond their capacity in the matter of work, and a liberal supply of veterinarians resulted in maintaining the army transport animals, like the men, in a remarkably healthy state.

THE HORSE DEPOT.

A horse depot forms part of the divisional organization and supplies remounts and reserve animals for the artillery and train. The depot is normally in charge of a cavalry officer.

A visit to the horse depot of the First Division in August, 1905, at Takou, 13 miles northeast of Fakumen, revealed the fact that this particular depot was in charge of a train lieutenant. His personnel comprised 1 veterinarian, 8 noncommissioned officers, and about 150 men from the cavalry and train, mostly the latter. There were only 60 horses in the depot at the time of inspection. The maximum number of animals on hand for the three months preceding my visit was 170, but the commandant stated that the depot sometimes held several hundred animals. The animals were paraded for inspection and showed up well, especially those intended for the cavalry and artillery. They all came from Japan, no Australians having been forwarded.

SYSTEM OF COMMUNICATIONS BETWEEN UNITS OF THE FIELD ARMY.

The duty of maintaining communications between the different units of the field army devolves on the field telegraph detachments, which correspond to the Signal Corps in the United States Army.

ORGANIZATION.

In time of peace there is no separately organized telegraph detachment, but certain men, presumably those who are already practical telegraphers, are detailed from the engineer battalions to Tokyo, where they receive instruction.

In time of war one field telegraph detachment to each division is organized from the engineer battalion, whose peace organization is changed from four companies to three of war strength. This telegraph detachment, 195 officers and men, is commanded by a major or captain, under the direct orders of the division commander. The personnel continues to wear the engineer uniform, but discards the rifle and the ammunition pouches, wearing side arms only.

An army telegraph detachment is formed by details from the divisional detachments and placed directly under the orders of the army commander. It is commanded by a major or captain and varies in strength according to the size of the army and other circumstances. For the Third Army, during the summer of 1905, it numbered over 300 men.

As the combatant strength of a division is about 14,000 men, the field telegraph detachment forms about 1½ per cent of the command. In conversation with a staff officer, toward the close of the war, I was informed that experience had shown that an increase would be necessary in future wars.

EQUIPMENT AND METHODS OF TRANSMITTING AND RECEIVING INFORMATION.

Both the teléphone and the telegraph are employed for transmitting information. The normal allowance of material to different units is as follows:

Army headquarters, 130 km. of wire and 15 sets of instruments.

Division headquarters, 50 to 60 km. of wire and 5 sets of instruments.

Independent cavalry brigade, 40 km. of wire and several sets of instruments.

Artillery units do not normally carry any telephone equipment but, when needed to establish fire-control stations, are supplied from the divisional or army detachments as circumstances may require.

Two kinds of telephones are employed, an ordinary backboard instrument with call bell, similar to the ordinary comneral telephone, and the "Ewata" telephone, s from its inventor. The latter is a compact, porta box and a combined receiver and transmitter packe rately from the box. This instrument employs a instead of call bell and has plug connections. The E is mainly for use by the cavalry. Both forms of tele use a ground return.

The telegraph instrument is the ordinary Morse re operated by rectangular porcelain cells using copper plate.

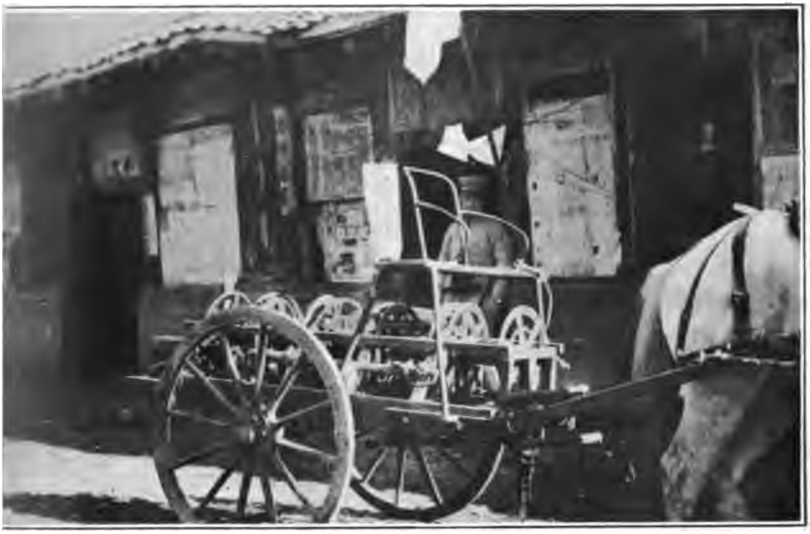
The principal kinds of wire employed are as follows:

1. Heavy rubber insulated, stranded copper core.
2. Bare copper wire about 14 B. W. G.
3. Galvanized-iron wire for telegraph.
4. A very fine insulated (paper apparently) copper w

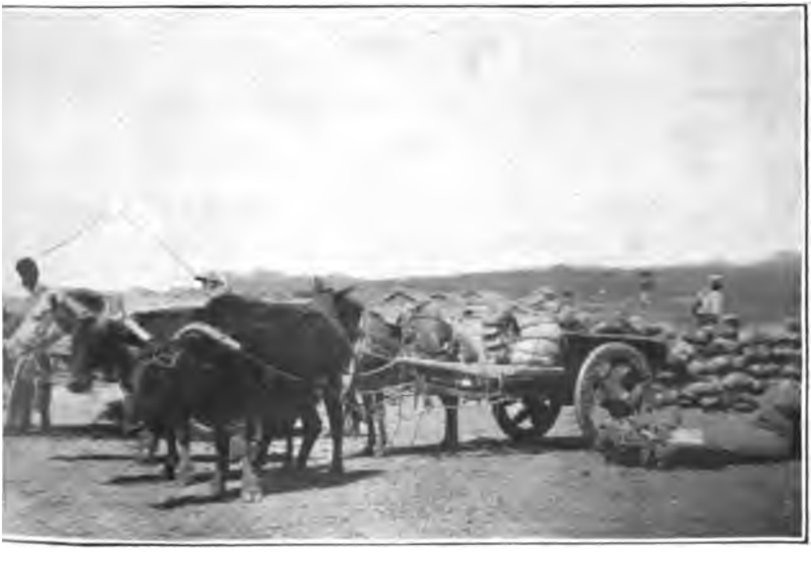
Wire is carried on reels, five reels on a frame, on the nary transport cart. In laying wire the reels are car two men who pay out wire as fast as they walk along. men follow. When pressed for time or when supply of is inadequate, the insulated wire is used, being run thr the fields and lifted clear of the ground only at road ings. The very fine insulated wire is carried on a sp reel suspended from the neck of a man who pays it out as walks along. This fine wire is so light that it can be ported on the kaoliang stalks or equally flimsy supports. has, however, only a limited application.

The field telegraph poles are 12 feet 2 inches long and inches diameter, made of a light wood resembling ash. Bamboo poles, plugged and banded at the end, are also used; the foot of the pole is shod with iron. The insulator is of ebo 3 inches long, 1½ inches diameter at base and 1 inch at the top, mounted on a square iron spike driven into the end of the pole. Across the top of the insulator is a slot ¼ inch by $\frac{3}{16}$ inch, with diagonally opposite lower corners undercut. By giving a slight turn to the pole the wire is bound in the slot so that it can not jump out readily. When extra high poles are required for clearing roads, buildings, or other obstacles, the ordinary pole is mounted on top of a 12-foot pole.

The army telegraph detachment has charge of the reserve supply of wire, instruments, etc., which are issued to the divi-



25. CART WITH REEL-FRAME.



26. CHINESE CART AT PULANTIEN.

nal detachments and replaced by requisition on Tokyo.
l telegraph and telephone material is manufactured in
pan.

As a general proposition when the army is at rest the com-
nications to the front are by telephone and to the rear by
egraph, although division headquarters may also be con-
cted with army headquarters by telegraph and army head-
arters to Manchurian headquarters by telephone. During
ttle when the army and division headquarters are on the
ove the telephone is used exclusively. Sometimes adjoin-
g brigades and divisions are directly connected by tele-
one, but this is exceptional. The cavalry brigade is con-
cted directly with army headquarters and also with nearest
vision or brigade headquarters.

When an army occupies a fixed position for any length of
me the telephone is freely used for connecting up not only
e tactical units of the army but its various depots and ad-
inistrative offices. During the long halt after Mukden the
adquarters of the Third Army at Fakumen maintained a
ntral telegraph and telephone office with a regular switch
ard for the different telephones and four telegraph instru-
ents, three to division headquarters and one to Manchurian
adquarters. Most extensive use of telephones was made
the Third Army before Port Arthur, not only all head-
arters being connected up but the various siege batteries
d sap heads, so that any part of the besieging line could be
ached at a moment's notice. The resulting saving in time
nd convenience may readily be imagined. In taking mes-
ges by telephone they are repeated back for verification,
e time noted, and then written out in duplicate, using car-
on paper.

So far as my observation extended the Japanese field tele-
raph detachments did remarkably good work during the
ar, keeping up connections at all times between the main
rmy units regardless of weather or whether the army was
n the move or at a halt. I have seen a section of the tele-
raph detachment march abreast of army headquarters, reel-
ng out wire and, the moment a halt was made, drive a bayo-
et in the ground, attach ground wire, and commence talking
ith scarcely a moment's delay.

Visual signaling is but little used in the field. The heliograph is not used and flag signaling is limited to th phore system, using two small sun flags. Appare noncommissioned officer in each company and battery a set of semaphore flags. The only occasion on w observed flag signaling used was at Port Arthur, wher employed by an observer on the flank to direct the fi mortar battery located in a ravine.

The ordinary Japanese transport cart was used for porting the material and equipment of the telegraph ments. Wire reels and poles were carried in suitable f set on the cart body. The boxes containing the instr and material are painted yellow and are lashed to the like any other supplies. Generally a number of Chines carrying various packages accompanied the transport indicating that the regulation allowance of transpor was insufficient. As the telegraph detachments were al more or less broken up into small parties scattered over a siderable terrain, no opportunity for observing the transportation presented itself, and information on this p was not otherwise available.

The foregoing applies only to the telegraph and telep service within the sphere of the field armies. The servi communications along the lines of communication is in char of an étape telegraph detachment, a branch of the offic the inspector-general of the lines of communication.

The connecting link between the field telegraph servic Manchuria and the cable service to Japan was secur through a military cable from Pitzewo to Chemulpo, laid the time the Second Army landed. From Chemulpo the li of telegraph followed the line of the railway from Seoul Fusan, and thence by commercial cable to Japan.

The free use of the telegraph and telephone for connecti up the units of the field armies was rendered possible larg owing to the passive attitude of the Chinese and the lack o enterprise of the Russian cavalry, and very few interruptio of the service occurred. Where hostile inhabitants and a active enemy have to be reckoned with it may well be ques tioned whether an extensive telephone and telegraph servic will alone meet the requirements of maintaining connectio and whether it will not be necessary to supplement it by some system of visual signaling.

JAPANESE TRANSPORT AND SUPPLY SYSTEM.

The head of the entire Japanese transport and supply sys- m is the director-general of étape, whose department ex- ts in time of war only. The director has functions con- rming generally to those of the Quartermaster-General f our Army, with, however, some important differences. he office is regarded as most important, as may be judged rom the fact that the incumbent is attached to the Imperial Ieadquarters and may sit, but not vote, in the Supreme Mili- ıry Council.

The organization of the bureau, as laid down in the print- d regulations, is as follows:

1. Department of communications.
    - (a) Étape telegraph.
    - (b) Étape postal service.
2. Transportation department.
    - (a) Base commanders.
    - (b) Station commanders.
3. Intendance department.
    - (a) Quartermasters.
    - (b) Field treasurers.
4. Department of sanitation.
5. Staff officers.

Under the director-general of étape are the army étape in- spectors, one for each army, whose functions are analogous o those of the chief quartermasters of our field armies. These army étape inspectors are under the orders of the ırmy commanders as well as under the director-general of tape.

The organization of an army étape inspector's bureau, as prescribed in printed regulations, is as follows:

1. Chief staff officer.
2. Adjutants.
3. Staff officers.
4. Gendarmes.
5. Telegraph.
6. Post.
7. Transportation department.
    - (a) To the front.
    - (b) To the rear.

8. Field sanitary service.
    (*a*) Étape hospitals.
    (*b*) Transport of sick and wounded.
    (*c*) Veterinary and horse depot for officers' mounts.
9. Intendance.
    (*a*) Field treasurers.
    (*b*) Purchasing agents.

Under the army étape inspectors are the étape or station commanders on the lines of communications. The organization of a station commander's force, as prescribed in the regulations, is as follows:

1. Noncommissioned officers.
    (*a*) Cooking.
    (*b*) Quartering.
    (*c*) Receiving agent.
    (*d*) Dispatching agent.
    (*e*) Personnel.
2. Gendarmes.
3. Auxiliary trainmen.

Such is the prescribed organization of the étape service which takes entire charge of the transport, supply, and medical service in rear of the field armies, bringing all these under a single head at the Imperial Headquarters in Tokyo.

Actually the above organization underwent some modifications as the war progressed, chief among which were the following:

1. After Liaoyang three of the four Japanese armies became united, and although the line of communications to the Yalu was still maintained, practically all supplies were obtained from Dalny and Yingkou via Liaoyang. In other words, the separate lines of communication formerly existing became more or less merged. To meet this condition the occupied territory in rear of Liaoyang was placed under the Liaotung garrison with General Nishi, late of the Second Division, in command, and the entire étape service from Dalny to Liaoyang placed under a single service in all respects similar to an army étape service.

2. Until Mukden the director-general of étape of the Imperial Headquarters communicated directly with the army chiefs of service, Manchurian army headquarters; in other words, having no control over the étape service. After the

JAPANESE ÉTAPE SERVICE

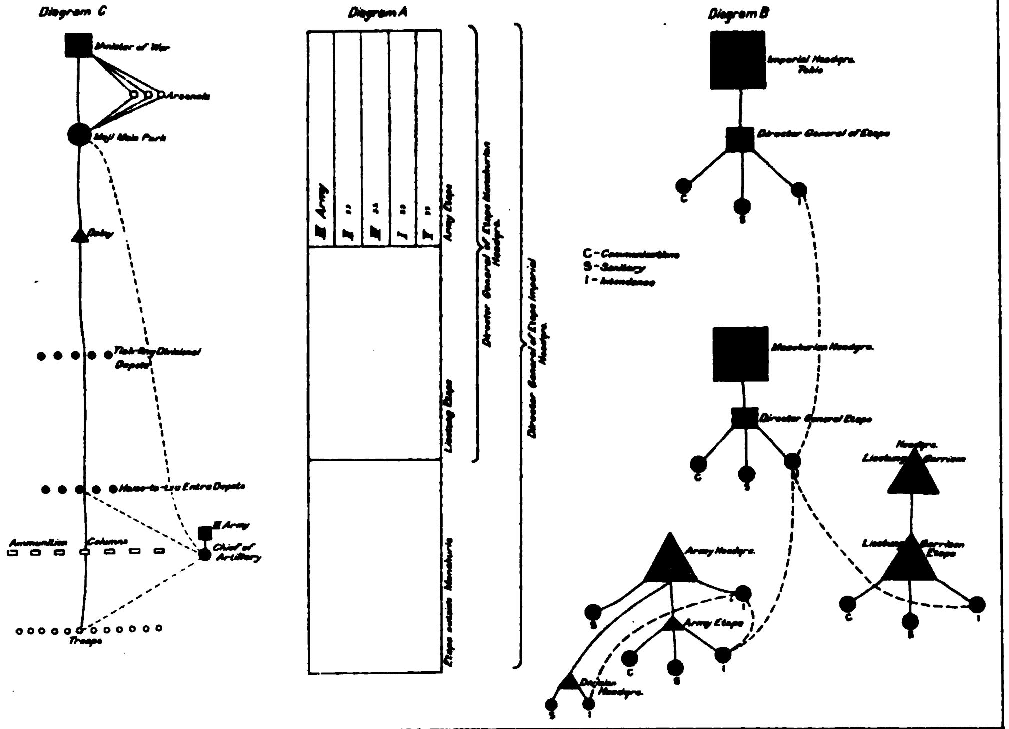


PLATE III

le of Mukden the director-general of étape was trans- ed to the Manchurian army headquarters, leaving to the perial Headquarters only the étape service outside of an.

he organization of the Japanese étape service corresponds ts general features to that of the German army.

eferring to Plate III, Diagram A shows the relations ex- ng between the various étape services as a whole. In gram B is shown the relation existing between the various cials of the étape service with special reference to the endance department. A similar relation obtains in the e of the sanitary service. The intendance and sanitary cials are detailed from their respective departments, while communications department is in charge of staff officers. agram C shows the method of maintaining the ammuni- n service. There is no separate ordnance department in Japanese army, the chief of artillery at army headquar- s performing the functions of an ordnance officer in our mies.

Supplies for the army are obtained either by purchase der contract, calling for delivery at some port of embarka- n, or by manufacture in Government establishments. The ter method applies chiefly to clothing and ammunition, though some provisions are also put up by the army stores partment in Tokyo.

The possession of a heavily subsidized merchant marine ade a large fleet of transports immediately available upon e outbreak of the war. Of the several subsidized steamship mpanies in Japan, the Nippon Yusen Kaisha is the largest d claims 260,000 tons of shipping, including a number of 000 to 6,000 ton vessels engaged in the European and Amer- an trade. These subsidized ships were called in as fast as eded and fitted out at the naval base for transport purposes. he ships are taken over from the several steamship compa- ies with their crews complete.

The main port of embarkation or naval base in Japan is jina, near Hiroshima. This port is in a well-sheltered part f the Inland Sea, having rail and water connections with ll parts of the Empire. It should be remembered that jina is a port of embarkation prescribed in the regulations, nd that it was used as such both in the China war of 1894-95 and in the Boxer war of 1900–1901. This previous exp ence, together with a certain amount of existing facili enabled the port to be used at once without confusion.

Osaka and Moji were used as ports of embarkation t limited extent. The completion of the harbor work Osaka in the fall of 1904 made available the one and port where ships of 6,000 tons could tie up alongside a wh Osaka Harbor consists of a detached breakwater, a sea w and a pile pier some 800 feet long and 60 feet wide. M is the main ammunition depot as well as the coaling port f all transports.

The different naval bases are in charge of director transport, who are officers detailed from any branch of t service. The director of transport at Ujina was a colonel engineers while those at Osaka and Dalny were colonels artillery.

Inasmuch as the duty of guarding the sea line of commu cations devolves upon the navy, some relation must nec sarily exist between the latter and the army transport serv The regulations prescribe that the director of transport a the naval base shall be assisted by a naval officer wh duties, as translated to me by an official interpreter, are "t attend to the naval signals and to receive orders as to t destination of the vessel, which are communicated to the ca tain thereof after leaving port." The larger transports al carry a naval officer, who is designated the "superintend officer." Thus, out of four crossings between Japan a Manchuria on different ships, the three largest carried nav officers, while the fourth, a smaller vessel, did not. Unt after the destruction of the Port Arthur squadron all ship leaving Japan were required to call at the naval rendezvo in the Elliot Islands, where they received orders from th fleet with instructions when and how to reach their final de tinations. The functions of the naval officer on board see to be limited to interpreting naval signals from the fleet an the signal stations en route. During the period when th Vladivostok squadron was active the transports were re quired to hide their lights at night.

The fitting out of the transports to adapt them for their special purposes is exceedingly simple, economical, an practical. Space between decks intended for troop accom

dation is subdivided by the introduction of an inter-
ediate deck, supported by rough 4 by 4 inch wooden
sts braced together and wedged between the floor and
e ceiling. By inserting an intermediate deck in the space
ove the main and in that above the orlop deck four troop
cks become available. These troop decks are then cov-
ed over with straw mats 3 feet wide by 5 feet 8 inches
ng, which completes all the berthing arrangements on a
panese transport. Temporary wooden steps down the
tch openings give access to the different levels. The
inimum floor space allowed each soldier under the regu-
tions is a rectangle 6 feet by 2 feet, with about 3 feet
f head room, so that the soldier may sit comfortably,
apanese fashion, without striking his head. Ventilation
effected by the use of canvas air chutes and port scoops.
hese, with the open hatches, extending through two decks,
eep the air reasonably pure, although short of what would
e expected by American officers. The soldiers sleep on
he berthing floor as near the hatches as possible, and store
heir equipments around the perimeter farthest from the
pening. During rainy weather a canvas awning is spread
ver the hatch opening. The necessity for battening down
atches rarely or never occurs, as the transports can always
nake shelter in a few hours in case of rough weather.
From Moji to Dalny is but 704 miles, which is covered in
rom forty-eight to sixty hours, with sheltered anchorages
mong the islands off the southwest Korean coast. One
hing that did not produce a favorable impression was the
smoking and use of uncovered candles in the confined berthing spaces. The fact that none of their transports took
fire must be attributed to the general good fortune which
seems to have attended the Japanese throughout the war.

The toilet conveniences on board transports are simple wooden privies built on the spar deck, usually in groups of one urinal and three closets. These privies consist essentially of a zinc-lined wooden trough with a good slope, the urinal occupying the upper end. This trough discharges outboard into a canvas tube, leading down close to the water. The trough is flushed at frequent intervals, using a hose, and the contents swept overboard through the canvas tube. Lime is freely used, and the privies were remarkably free from [illegible] arrangements. [illegible] arrangements are [illegible]

[illegible] arrangements [illegible] wooden [illegible] a great [illegible] berth [illegible] wooden [illegible] berth deck [illegible] and [illegible] on the floor or sitting on the [illegible]

[illegible] the arrangements for berthing [illegible] with the national habit of using [illegible] enables the Japanese to carry [illegible] per ton of shipping than [illegible] I was informed by one of the tra[illegible] that during the China-Japan war they had [illegible] per man but found this [illegible] and that they now allow at least 1½ tons per [illegible] As an [illegible] the [illegible] Maru, 6000 tons, upon [illegible] carried 2500 troops and [illegible] without any appearance of crowding.

For transporting horses, knockdown stalls are cons [illegible] in any part of the ship from the hold to the spar [illegible] These stalls are quite simple and ingenious. They [illegible] essentially of a front and rear row of stanchions with de [illegible] able side rails and wooden feed boxes sliding up and [illegible] in wooden cleats spiked to the front stanchions. A [illegible] tinuous half-round rail is spiked to the rear stanch [illegible] Cleated platforms on the floors of the stalls complete [illegible] arrangements. By removing one or more of the feed box

l the side bars the animals are led, one at a time, into a
ge of stalls, beginning with the farthest, and the side bars
laced successively. The horses are fastened to the front
nchions by two head lines, which prevent them from biting
ir neighbors, which, being stallions, they would other-
se be sure to do. The horses all wear straw shoes, both to
vent them from slipping and to reduce the noise that
uld otherwise result from their pawing the floor. These
aw shoes consist of a pad about three-fourths of an inch
ick, with two cords, one front loop, and two rear loops.
attach the shoe the horse's hoof is placed upon the pad,
ch cord passed around the front of the hoof through the
ar loop and back around the front of the hoof, where the
o cords are twisted together and then passed through the
ont loop and fastened by a number of turns and half
tches. In this way the pad is fastened to the hoof, with-
t any possibility of chafing, and held securely in place.
hese straw shoes are in common use in Japan and may be
urchased at any wayside village for the sum of 1½ cents
old per pair.

In rough weather the animals are supported by canvas
lings fastened to the side bars of the stalls. Forage and
ater, the latter in canvas buckets, are lowered to the differ-
nt decks as required for feeding. As in the case of the men,
entilation is provided by the open hatches, aided by canvas
wind chutes. In the hold and on the spar decks the ventila-
ion is sufficient, but between decks, owing to insufficient head
room, it is decidedly bad, and the animals appear droopy and
of indifferent appetite in consequence. What I have seen of
stable management on board ship is distinctly bad, the stalls
being poorly cleaned and forage wasted. Too much grain
and not enough long forage is habitually given.

The first-class passenger accommodations are reserved for officers and, being of the usual type, call for no remark. Each ship destined for troop and horse transport carries a suitable complement of medical officers and veterinarians. A simple wooden shed on the after spar deck serves as a dispensary.

The entire transport arrangements are characterized by extreme simplicity and economy, but are nevertheless well adapted to their purpose. From our point of view there is much that is open to criticism, but with a nation pos- the peculiar characteristics of the Japanese much of t cism must fail. I am satisfied that the entire cost of out a 3,000-ton ship for transport purposes on the Ja plan does not cost more than $1,000. Not only is th economy a creditable feature, but the time required to f ship is a minimum. It should be added here that transports, especially the smaller ones, were used as boats entirely and were not fitted out or used for porting men or horses.

As to the number of transports employed during th I was informed by a transport captain that about 1 the maximum, of which about 30 were ships of 3,00 or over. After the bulk of the troops had been trans to Manchuria a number of the transports were repor the daily press as having been released.

With the exception of Osaka and Dalny, none of ports of embarkation or debarkation had dock faci and all men, horses, and supplies had to be lighter and from the ships. This was effected by the native s pan, a flat-bottomed boat propelled by a single scull, being as large as 30 to 40 feet long and 10 to 12 f beam. For embarking horses the sampan is brought s on against a floating stage connected to the quay wa shore by an inclined wooden ramp with side rails. cleated platform connects the floating stage with the tom of the sampan. Five horses, 40 men, or 5 ton stores constitute the average loads. Many hundred these sampans were carried to the Korean and Manchur coast for use in landing operations.

At Ujina, the main naval base, there are extensive st houses, barracks, and hospitals, all of simple and inexp sive construction. When a transport is to be loaded hoists a signal flag to guide the lighters. Supplies inten for shipment are stacked in the open or under cover n the landing stages. A flag corresponding to that of t transport is attached to the supply stacks, which are im mediately attacked by gangs of coolies, who transfer t indicated supplies to the sampans, which are sculled fast as filled to the ship. When stores and horses ar aboard the troops are embarked and proceed to their bert aces, which have been previously marked with the organi-tion or the number of men to occupy them. Everything oceeds with the greatest smoothness and dispatch, and th a marked absence of noise and confusion, notwith-anding the numerous boats and personnel required to load d unload. The transports coal at Moji, usually on the turn trip. The coal is put aboard by contractors in the me manner as practiced by merchant vessels.

Various points of debarkation were used in Manchuria and orea, depending upon the particular army concerned and he progress of the campaign. Troops and supplies for the irst Army were at first landed at Chemulpo and later at hinnampo as soon as the advance of the army had uncov- red this point. After the battle of the Yalu the mouth of his river became the port of debarkation for the advance pon Liaoyang. The Second Army debarked at Yentaiwo, a few miles south of Pitzewo, which served as a landing place until after the battle of Nanshan, when Liushutun, in Dalny Bay, and later Dalny, became available, Pitzewo being abandoned. When the Second Army had reached Kaiping, a temporary landing was established at Hsiungyocheng, the supplies being landed at Liushutun, moved overland to Chinchou Bay, and reshipped in Chinese junks. After the occupation of Tashihchiao and Yingkou, the latter became the main point of debarkation for the Second Army, and Hsiungyocheng was abandoned. For the Fourth Army Takushan was used as the point of debarkation for its advance to Liaoyang. After the battle of Liaoyang and the junction of the three field armies at this point, the base at Takushan was abolished, and all three armies were supplied via the railroad from Dalny and Yingkou. The Yalu base and line of supply were still maintained, but do not appear to have been used to any considerable extent until the appearance of the Fifth Japanese Army, the so-called Army of the Yalu, in January and February, 1905. This army was posted on the right of the First Army in the mountainous country southeast of Mukden and was supplied entirely by way of the Yalu. With the opening of navigation in the spring of 1905, the Liao River was utilized as a supply line for the Third and partly for the Second, First, and Fourth armies.

Coming now to the subject of land lines of transport, it

[illegible]

[illegible] and operating the [illegible] of communication [illegible] charge, among them [illegible] This department organized a [illegible] and commenced the [illegible] and locomotives were shipped [illegible] Here I want to [illegible] that the work of the Japanese railway department was [illegible] and that the deliberation [illegible] in inaugurating a satisfactory railway service would [illegible]

ne moment be tolerated by us. Dalny was occupied the
f May, 1904, and the first train did not reach Liaoyang
October 1, four full months later. The process of nar-
auging was a most simple one, a single rail only being
d, first removing the inner line of spikes. Nor was any
ular effort made to increase the train movements to
ng like what was demanded to supply the needs of the
until after the battle of Mukden. Meanwhile the in-
te railway transportation had to be supplemented by
ds of Chinese carts and the expenditure of millions of

ing the alteration and equipment of the railway the
e utilized the captured Russian cars by organizing a
f push trains, each car being moved by from 15 to 18
r train soldiers. These trains were operated in
f from 20 to 30 cars, making 15 to 18 miles daily,
as the average distance apart of stations. While
nomical than the Chinese cart, these push trains did
the transport materially, owing to their slow speed.
rk of narrowing the gauge progressed a train serv-
adually developed, the push trains being meantime
d. The push-train service was not maintained
ntai.

ly train movements, few in number at first, were
increased as more rolling stock became available,
end of the campaign eight trains were dispatched
from Dalny and Yingkou via Tashihchiao to
nd Tiehling. To provide for the increased train
between Tashihchiao and Tiehling, amounting
ains daily, additional sidings were put in on this
e road, a distance of about 125 miles. With the
proach of the Baltic Squadron the Japanese
to accumulate at Dalny and Yingkou, in the
a six-months' reserve supply of stores for all their
nchuria. Dalny is an open port the year round.
ally closed by the 15th of November, remained
onth later, owing to the mild winter. To house
extensive sheds were erected at Dalny and
ese sheds consisted of simple framing covered
ed galvanized sheet-iron roofs and sides. Simi-
also erected at the advanced depots at Liao-

[illegible]

[illegible] the Japanese [illegible] of the country. I [illegible] pounds per man per day [illegible] requirements. A Japanese freight car carried [illegible] that one train of [illegible] cars would carry [illegible] tons [illegible] trains, the maximum reached at the end of the [illegible] would carry [illegible] tons. This is assuming that every [illegible] train carried freight only, which was not the case. Although the troops usually marched from Dalny, they were occasionally moved by trains, and a certain number of passenger cars were kept moving for the transport of wounded officers and high officials. Thirty men or six horses could be carried in a car, the latter being placed three at each end with their heads toward the center of the car.

Before the railway became available and for long after, until it had reached its maximum capacity and the Liao River line had been added, the deficiency in rail transport had to be supplemented by the Chinese cart. This fearful and wonderful vehicle is the outcome of centuries of experience, and about the only thing that will stand the wear and tear of the so-called Manchurian roads. In normal times the bulk of the carting is done in the winter months when the ruts and inequalities of the roads become filled with snow and ice and worn smooth by traffic. It is then that the natives haul their products to market and lay in their annual stock of supplies. The exigencies of the war, however, called for transportation the year round. The roads of Manchuria are simply tracks which wander from village to village along the lines of least resistance. When a spot gets too bad the carter simply strikes out in a new path, often through cultivated ground, uthlessly laying waste a strip of growing grain. Fences are nknown, and the farmers' efforts to confine the roads by dig-ing pits and throwing up embankments along the edges of is fields are too often labor wasted. Road building is an nknown art, the idea of reducing the resistance having pparently never occurred to the natives who seem to prefer he more costly method of increasing the power until as high as seven animals may be seen hooked up to one cart, which nay be any possible combination of ponies, donkeys, mules, or oxen. Seated upon the shafts or walking alongside, the carter guides and controls his motley team by voice and whip, without the use of lines.

The Chinese cart consists of a strongly framed platform resting upon a wooden axle turning with the wheels. These latter have four felloes, supported by one main and two secondary braces. The braces are of oak and the felloes of some tough-grained wood resembling elm. The heavy grooved tires, in four sections, are spiked to the felloes by eight large spikes to each section. Each felloe has thirty large flat-headed spikes driven through from the outside and clinched on the inside. The outside gauge of the wheels is 3 feet 10 inches. The carts invariably follow the ruts made by their predecessors, so that these become so deep that at times the axle scrapes the ground. The cart is so heavy and strong that it is practically unbreakable, and plows its way through mud or rumbles over stones with equal certainty and indifference.

During the height of the rainy season any general movement is simply out of the question in the valley of the Liao River, and it is about all the troops can do to keep their daily necessities supplied by pack trains from the nearest depots, which have been stocked to meet this contingency.

It is not too much to say that but for the Chinese cart the war would have been impossible for the Japanese, who had no system of army trains such as were employed by us during the civil war. Transport by Chinese carts was a costly proposition. The average daily cost of carts was 7 yen, for which 20 bags of rice would be carried from 15 to 18 miles. From Dalny to Liaoyang it is 10 étape stations, which brings the freight charges for 20 bags of rice to

[illegible]

[illegible]

[illegible]

[illegible] feature of the Japanese [illegible] was the fact that they were [illegible] Although there were [illegible] sported from Japan as the principal food for their es, eked out with small quantities of compressed hay or er from Australia or America. The failure to utilize forage could not have been due to any fastidiousness on part of the Japanese horse, for the latter will eat any-g down to tree bark and wood shavings. The mules and es of the Chinese thrive upon the local forage, and, in spite xtra hard work due to the war, looked on the whole much er than the Japanese ponies. The Japanese soldier, too, t have his rice above all things, and disdains the kaoliang idge, which is the staple diet of the Chinese and which Russian soldiers were not above eating on occasions.

must of course be admitted that given their normal and ustomed food both men and horses will do better work remain in better health than with food foreign to their es. The Japanese troops were certainly well fed and sup-d from every point of view and showed the result in ir excellent physical condition which all agree was better n when living in garrison in Japan. This result, however, s attained only at the cost of a severe strain upon the trans-t and a consequent sacrifice of mobility.

Vith the breaking up of the ice in the Liao in April, 1905, s stream became available as a supply line and was im-diately put into operation. The Liao is a great trade ery during the season of navigation, and on its banks are umulated the various products of the country by carting ring the winter for shipment to Yingkou. The boats ployed in this traffic are heavy flat-bottomed junks with ingle lateen sail. The boats are about 30 feet long and 12 15 feet wide, drawing less than 2 feet when loaded. Their ximum capacity is about 7 tons, but when navigating the ghest reaches of the river they reduce their loads. They e manned by a crew of four men and make the round trip tween Yingkou and Hsiaotatzu, the head of navigation ed by the Japanese, in one month. It is stated that there e some 15,000 junks on the river, of which probably 5,000 ere employed by the Japanese, judging from the daily rivals at Hsiaotatzu.

Tungchiangkou was at first selected as the advanced river pot, probably because it was the recognized head of navi-ation for the Chinese trade, but, owing to the low ground

[illegible]

As an illustration of the practical working of the Japanese [illegible] system when an army is on the march and when at rest, I have selected the Third Army during and after the battle of Mukden as an example. After the capitulation rt Arthur the Third Japanese Army commenced its north-rd movement without delay. The artillery and other iterial was shipped over the railroad to Liaoyang, but the ops, with the exception of several battalions which had en hurriedly dispatched by train to Yingkou to meet Gen-l Mishchenko's raid, marched overland, being fed and artered at the several étape stations along the line of com-nication from Dalny to Liaoyang. The movement was mpleted by February 20, 1905. The Third Army was now sembled behind the Taitzu, in rear of the Japanese left ng, and billetted in the villages between Hsiaopeiho and shaling. General Nogi commenced his flank march on bruary 27, his army consisting at first of three line divi-ons, one Kobi brigade, one artillery brigade, and one cav-ry brigade—about 75,000 men of all arms, including non-mbatants. The advance was based immediately upon siaopeiho, where supplies sufficient for one month for three ivisions had been previously accumulated. This supply pot had been filled, partly from Liaoyang and partly from ingkou direct via the Chinese town of Newchwang. From iaoyang to Hsiaopeiho is about 20 miles, with an intermedi-te étape station at Tashaling. Hsiaopeiho is virtually in ront of the initial position of the Third Army, and, in fact, his depot was established in this advanced position with nly a cavalry screen in front. Before the advance began he general staff of the Third Army had selected the étape ine and fixed the same as far as Shahotzu, the line passing hrough Shakoutzu, Tahoangchipu, and Shahotzu. The urther extension of the étape line was to depend upon the rogress of events. On the 9th of March a station was pened at Mashanchiatzu and after the battle the line was till further extended to Tsailopu.

I started from Liaoyang on the morning of March 6 to ride over the line of communications of the Third Army, via Tashaling and Hsiaopeiho, and had a good opportunity for observing the workings of the Japanese étape service. The various étape stations were in charge of officers of different branches of the service, captains and majors, and, judging from their ages, reserve officers apparently. Streams of carts were passing to the front and rear, including Chinese

carts, handcarts, and Japanese pontoon wagons. Th
ter appear to have been utilized to help out the defici
transport and could very well be used for this purp
there was no use for the bridge trains at this time, the
all being frozen hard. At Hsiaopeiho there was an enor
quantity of supplies stacked in the open under paulin
the station presented a very busy appearance with th
dreds of carts coming and going. At both Tahoang
and Shahotzu the station commandants complained
difficulty of securing sufficient Chinese carts to suppl
demand. About 300 carts were required to supply the
minimum demands, whereas they had been able to
only about half that number, although they were pay
high as 11 yen per day for carts. Apparently the Ch
carters had been carried off by the retreating Russia
had been overcome by fear and fled. The latter view of
case is supported by the statements of an English-spea
corporal employed in the étape service, who told me
great trouble was experienced in keeping the carters
their work, as they were constantly trying to run away
their loads when near the advanced depots. During the
of the battle the étape service was limited to forwarding
the daily food requirements of the troops, such things
forage, fuel, and medical supplies being out of the quest
on account of the deficiency in transport. Streams
wounded were observed coming to the rear, some on stret
ers carried by Chinese coolies, some in empty carts return
from the front, and a large number on foot, the latter b
light cases. All the étape stations were organized with
commandant, a lieutenant as assistant, some five or six
commissioned officers, and a detail of train soldiers. N
withstanding the heavy strain on the transport service du
ing the battle, I received most excellent treatment, includ
comfortable sleeping accommodations in Chinese houses a
an abundance of wholesome food.

A significant feature of the étape service was the forward
ing of reserve troops during the battle. I observed
number of detachments of reserves, in one case as many
thousand of all arms, who showed by their fresh cloth
and new equipments that they had just arrived fr
Japan. It was quite evident that in their preparations f

attle of Mukden the Japanese had included the forward-
of reserves to make good their anticipated losses and that
e of these reserves actually joined during the fight.
fter the battle of Mukden the Third Army was faced
at and took up a line along the left bank of the Liao,
ilopu being the advanced étape station. On the 17th of
ril the army crossed the Liao and took up a line through
umen. The rail head was meanwhile advanced to Hsin-
zu and three bridges thrown across the Liao at Shifossu,
nutun, and Kaotaitzu. On the 4th of May the Third
my made its final advance to the line Kangpienhsien to
inchiatun, which it held until the termination of hostilities.
antime the Liao River line had been put into operation,
t to Tungchiangkou and later to Hsiaotatzu, while the
l head was advanced to Tiehling and later to Kaiyuan and
angtufu.

Tiehling became the main advanced depot on the rail line.
om here an étape line was maintained to Fakumen, with
e intermediate station at Ssuchiatzu. So far as the Third
rmy was concerned, this line was used mainly for the field,
st, and reserve troops. Practically all food supplies for
e Third Army came by way of the river from Yingkou,
ing landed at Sanmiencheng, Tungchiankou, or Hsiaota-
u. From Sanmiencheng an étape line ran to Fakumen
rough Takuchiatzu and from Hsiaotatzu one to Kang-
ienhsien. Ammunition for the Third Army arrived by rail
t Tiehling, where it was transshipped by junk to Hsiaotatzu.
ick and wounded were evacuated mainly through Hsiaota-
zu and Tungchiangkou, whence they were taken by boat to
iehling, there to be entrained for Dalny.

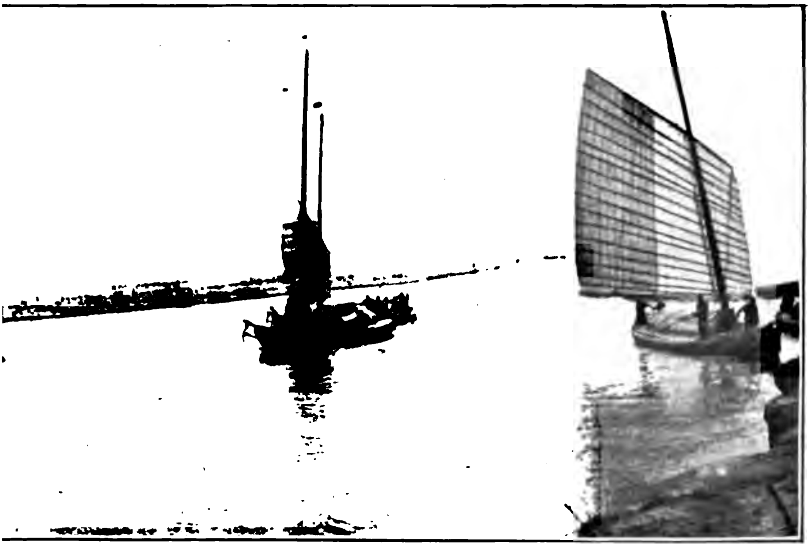
To provide for the rainy season, which comes during July
nd August, the different advanced depots were stocked up
ith a month's reserve supplies, which were still further dis-
ributed in smaller depots so as to be convenient to the
roops. This proved a most fortunate provision, for dur-
ing the first two weeks of August all wheeled traffic was
at a standstill along the low ground adjoining both banks
of the Liao.

During the battle of Mukden the headquarters of the Third Army étape inspection were at Hsiaopeiho. Some time in June these were moved to Fakumen. Major-General

Obata was the étape inspector of the Third Army, and assisted by a staff of three officers, in addition to the of intendance and of the sanitary service.

The Japanese pony cart is a toy affair quite in ke with the miniature equipment of the Japanese. It strong and well built, and stood the wear and tear of rough roads remarkably well. Its weakest points ar shafts, which occasionally broke at the junction with body. The pony harness developed a number of spots, mainly the saddle, which, being insufficiently pa and having the shaft band rigidly attached, produced sore withers, due to the rough roads where the wheel suddenly drop into a rut 18 inches deep and bring a v wrench on the saddle. This was remedied in the fiel the use of blanket padding under the saddle. In one of divisions all the regulation saddles were replaced by s buck frames with rollers over which the shaft strap play freely—an idea borrowed from the Chinese cart har In the veterinary hospital at Telissu in August, 1904, counted nearly 200 ponies, nearly every one of them su ing from frightful wounds in their withers, chunks of th having literally been torn out by the cart saddles. T breast strap also produced a good deal of chafing, due doubt, to the angle of draft, and was pretty generally di carded by the end of the war in favor of the Chinese coll and wooden hames, as shown in the photograph. T gauge of the Japanese cart is 3 feet 8 inches, and, whethe by accident or design, fits that of the Chinese cart, wh was a most fortunate circumstance, for the latter alway run in the same ruts, and any vehicle of a different gau would certainly be wrenched to pieces. The maximum lo of the cart is about 350 pounds, or 6 bags of rice, which the greatest I saw on the best of roads. More often 3 or bags were all that could be carried.

The light baggage of the troops is carried on pack pon which are also used for drawing supplies from the divisional depots when the state of the roads renders wheel transpo impossible. The pack saddle is a very serviceable outfit an in my opinion, a great improvement over the aparejo. It simple in construction, easily put on and off, and I never any sore backs from its use. It consists essentially of



27. JUNKS ON LIAO RIVER.

28. JAPANESE CART.

ed ribs, reenforced both sides by thin sheet steel, the ends he ribs bearing upon two boards sewed to the padding. padding is cut away over the withers and back so that no ssure can come on these parts. A blanket pad is placed er the saddle, which is kept from slipping by the crupper the breast strap. The lashing ropes are permanently ened to the saddle, and when not in use are coiled up out of way. Many of the loads are arranged simply to be hooked he ribs, which have two hooks each for this purpose. idea of the saddle seems to have been borrowed from the glish service in India. The usefulness of the saddle deds largely upon the fact that all Japanese military sups are done up in boxes or packages of convenient size and ght, so that they may be readily attached and balanced n the saddle. The bag of rice, weighing 60 pounds, is the viest and bulkiest package comprised in the regular list supplies. The box of infantry ammunition weighs about pounds and is the heaviest single package, but it is of all size. It is provided with two short chains and is ply hooked to the pack saddle.

Supply packages weigh on the average from 35 to 40 unds. The following are the dimensions and weights of ne of the principal supplies:

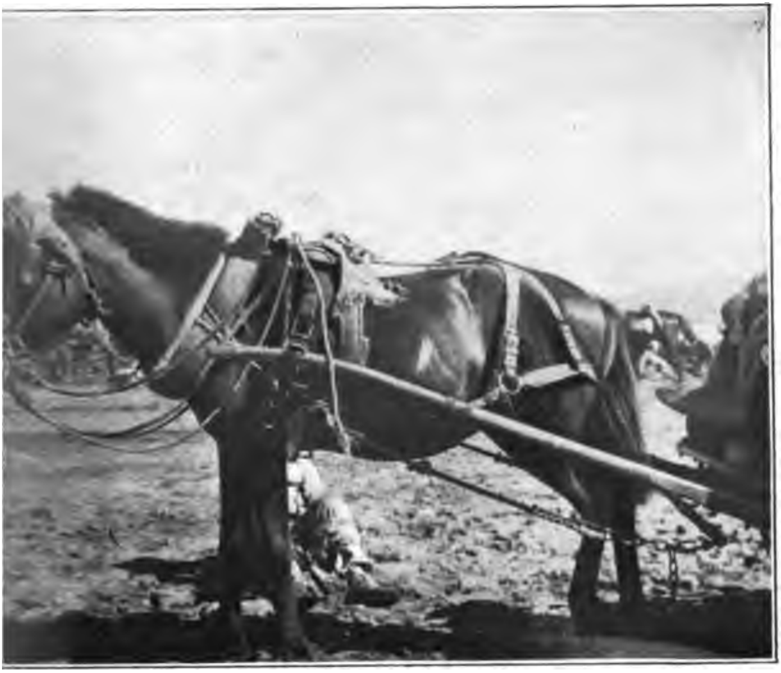
Supplies.	Dimensions.	Weight.
of dried fish	12 by 12 by 31 inches	35 pounds.
of vegetables	12 by 13¼ by 30 inches	Do.
of biscuit (60 packages)	12 by 14 by 23 inches	
of sugar	8 by 10 by 34 inches	50 pounds.
of vegetables	8 by 10 by 24 inches	28 cans.
Do	13 by 13 by 27 inches	35 pounds.
tralian compressed fodder	11 by 15 by 24 inches	
ed salmon	13 by 14 by 30 inches	Do.
Japanese soy	7¼ by 10 by 23 inches	
s Japanese sauce	13 inches high by 13 inches diameter.	
ned beef, 96 cans	9 by 11 by 26 inches	
of horseshoe nails	9 by 10 by 27 inches	
seshoes	25 pairs to the box	
é barrel	2 feet high by 22 inches diameter.	
cigarettes	24 by 21 by 42 inches	
e of socks (500)	20 by 20 by 30 inches	
e puttee leggings (160 pairs)		
e of blankets (12)	16 by 22 by 30 inches	
es of shirts and trousers	22 by 12 by 26 inches	

Grain bags are of uniform size, holding 60 pounds of ce and about 40 pounds of barley. All grain is put up rice-straw matting, that for rice being either double or with an inner bag of sacking. To distinguish the grain bags are bound with grass rope of different red for barley, white for rice, and green for oats. very little was used. Packing boxes are of lighter than used by us, usually half-inch stuff, and re around the edges. To still further strengthen the they are liberally wound with grass rope. So far observation extended, the packing for military suppl sufficient, and broken packages or bags were rarely se

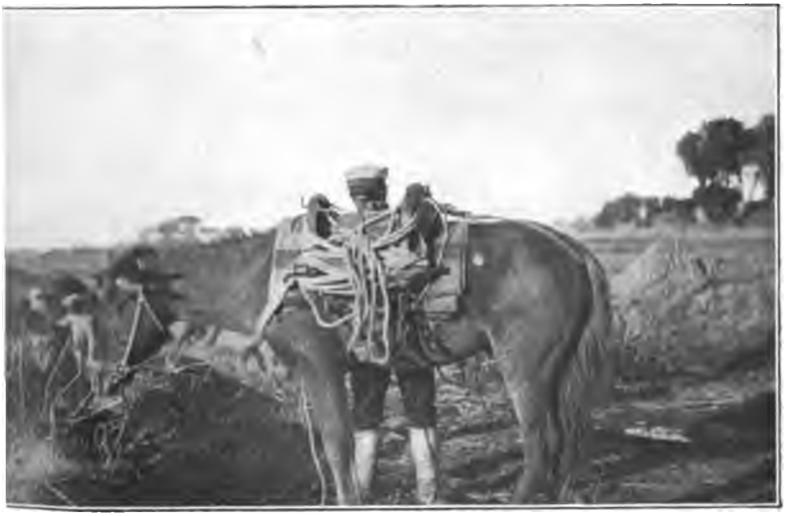
The light baggage of an infantry battalion consis ponies—18 for ammunition, 2 for intrenching tools, for medical supplies. The battalion heavy baggage of 30 ponies carrying one day's rations and the cooking fits.

With regard to the number of carts accompanying a sion, exact figures were not obtainable, as the Jap acting under superior orders, declined all information ing the strength and organization of their army un counted many provision columns and found them ru from 160 to 190 carts, and have been told that there about 200 carts to a column. The ammunition colu for 136 carts each for infantry and artillery. Each of 6 field hospitals calls for 22 carts. With an allowan the field telegraph detachments, bridge column, headqu etc., about 1,500 carts are required as a minimum. In dition to the wheeled transport 600 ponies are required the battalion pack trains. When it is remembered that every pony there is a transport soldier, it will be rea understood that the number of noncombatants in the sion is large. From the best sources of information number of train and transport men per division is over The divisional trains are all in charge of the train batta

The Japanese obtained their transport ponies in Jap through the prefectural governments. The animals, thoug small, are tough and wiry and capable of considerable en ance. Certain it is that the loss in horse flesh during the was remarkably small, and the Japanese seemed to be able supply their needs from their home country. That the co try was pretty well drained is shown by the fact that in spring of 1905 a consignment of Australian horses



29. JAPANESE TRANSPORT PONY AND HARNESS.



30. JAPANESE PACK SADDLE.

and shipped to Japan, but I never heard of their com- the front. Manchuria is filled with fine draft animals, , and mules, but the Japanese bought very few from tives. In one instance I came across a herd of about 40, I was informed, had been purchased locally at an ge price of 235 yen per head. The Japanese appear to husbanded their resources in horse flesh most carefully, was further aided by the slowness of their movements, ting any severe tax upon the endurance of their trans- animals.

conclusion, we have not much to learn from the Japa- nethods of transport and supply, which could find little cation to our Army. A system which requires eight men eight horses to transport what one of our four-mule t wagons with one driver can carry is not likely to be d to as a model. Probably the system is as good as any could be devised by the Japanese, considering their liar national characteristics and the quality of their able transport animals. If we have anything to learn the Japanese it is that we should work out some system rmy transport and supply complete as to details and d to our national habits. Our mules are the finest draft nals in the world, and we have as good wagons and har- as any nation on earth, and there should be no difficulty oing this. Last, but not least, we should secure some n of personnel to replace the present insubordinate and isciplined horde of teamsters and civilian employees upon m we have largely depended hitherto. This force should mply large to care for all the service of supply for the ny and render unnecessary the custom of detaching com- nt troops for duty in the transport and commissary artments.

NOTES ON ARMY ORGANIZATION AND GENERAL STAFF.

he organization, tactics, and training of the Japanese y are assimilated to those of the German and French nies, the influence of the former nation being the more nounced.

The division is the largest permanently organized unit d is a complete organization in all respects.

The organization of the staff of a division a
noted in the field, was as follows:

1. Lieutenant-general commanding.
2. The chief of staff, a colonel or lieutenant-co
3. Three officers of the general staff, majors or ca

These staff officers are apparently detailed to di
ties as the commanding general directs, one a
officer, one to assist the chief of staff generally, and
to attend to line of communication work.

4. Four adjutants, the senior a major or capt
senior has charge of all routine official correspon
nected with interior economy and discipline of the
appointments, transfers, and also the Japanese
pean) press correspondents. The remaining adj
special service officers and aids combined. They ca
bal orders in the field and can be detailed to assist a
other staff officers as required. All adjutants, regar
the organizations, wear yellow and white shoulder s

5. An intendance officer.
6. A chief medical officer.
7. A camp commandant, a detailed officer.

The staff of an infantry brigade consists of two adj
either captains or one captain and one lieutenant.
senior adjutant looks after the brigade operations, wh
junior attends to the personnel and routine matters.

The regiments are commanded by colonels or lieut
colonels, with a captain as regimental adjutant.

Both the brigades and regiments are tactical unit
appear to have little or nothing to do with question
supply, the battalions indenting direct upon division he
quarters. This arrangement is most commendable. d
away with a great deal of unnecessary paper work and sim
fying the whole subject of supply.

The maintenance of the field units is assured through
depot organization modeled on European lines. For t
Russo-Japanese war it was necessary to mobilize the re
ments in January and February, 1904, at which time th
were some 900 new men, who had joined only the month
fore, in the ranks. These new men were left behind a
the regiment filled to war strength from the first reserv
A depot battalion of some 1,500 men was then formed fro

w men, conscript reserves (i. e., men who had re-
rt annual training), some first reserves, and a
of old soldiers. This depot battalion occupies the
f the regiment and is put under the command of
o is a spare major of the regiment, the remaining
g partly from the regiment and partly from the
The depot battalion is put under training, and,
drawn from it to make good losses at the front,
ipts from reserves or the annual drafts, if latter
taken in to keep up the depot battalion.
ne time regiments of Kobi (second reserve, cor-
o landwehr in Europe) are formed, some of two
three battalions. The Kobi men have served
e-third years with the colors and first reserve.
service in the Kobi, formerly five years, was
n years by imperial edict during the progress
The Kobi men are quartered in the towns and
billeted on the inhabitants. The Kobi regi-
mmanded by lieutenant-colonels of regiments
fter a short period of training the Kobi regi-
aded, two or three regiments to a brigade, ac-
ether the regiments have three or two bat-
of the Kobi regiments have three battalions.
is contemplated to form one Kobi brigade for
ion, but actually a greater number of regi-
ed out and some of the Kobi brigades organ-
ns. Each Kobi brigade is supposed to have
e squadron, and one company of pioneers,
ul whether they all possessed their full com-
four arms. In February, 1905, I was in-
anese officer that eighty Kobi regiments had
to date. The Kobi troops were largely em-
the lines of communication and to garrison
y in Korea and Manchuria. Kobi regi-
ain a depot organization, after leaving for
hich they repair their losses. By this sys-
Kobi regiments are separately maintained.
i organizations, Japan also organized dur-
nber of new line divisions, complete in all
ew divisions made their appearance dur-
f 1905, one of them, the Fourteenth, being

attached to the Third Army. Rumors of the arrival of Fifteenth and Sixteenth Divisions were also circulate August, 1905, but this requires confirmation. It is, how certain that the Japanese were bringing up large reinf ments along the line of the railway at this time. It is surmised that the troops dispatched to Sakhalin belo to a newly organized line division.

A competent authority has stated that on the termin of hostilities Japan had 1,000,000 men under arms. her population of 45,000,000 she had by no means rea the limits of her resources in men, and every town village was filled with squads of soldiers undergoing struction. But the quality of her troops had underg marked change. Under the exigencies of war and the m severe battles the splendid first line troops had pretty disappeared from the ranks, which were now filled by of inferior physique and deficient training; in other w more or less raw levies. These later troops lacked of the dash and spirit of their predecessors, but were sim less seasoned and skillful.

Japan's chief difficulty, however, lay in the scarcity suitable material for company officers. At the very o of the war it was necessary to appoint a large number noncommissioned officers to fill up the existing vaca in the grade of lieutenant. As the war progressed the n ber of thoroughly trained and professionally educated o cers in companies and battalions constantly grew less, th places being filled by reserve officers and promotions fr the ranks.

While the efficiency of the personnel of the army w somewhat diminished by the heavy casualties incurred du ing the progress of the war, the fighting qualities of t troops showed no visible depreciation. The Ninth Divi which fought at both Port Arthur and Mukden, had ve few of its original men left when it entered the latter ba tle, yet it fought most gallantly and suffered more th any other division of the Third Army. I was inform that the Ninth Division had suffered a total of 21,000 ca alties at Port Arthur and Mukden, equal to 140 per cent of its combatant strength. The same division is credit iving lost 8,000 dead from all causes, battle and

regard to the fighting qualities of the different divihile all fought splendidly, those from the country were undoubtedly a shade better than those from cities.

e of war the divisions are formed into armies, or, perly, army corps, of from two to four divisions, ed by a full general with a numerous staff. As an f the staff organization, that of the Third Army at ur is given herewith:

eneral Baron Nogi, commander in chief.
ajor-General Idichi, chief of staff.
bchief of staff, Lieutenant-Colonel Oba.
o officers of the general staff, senior a major, in charge of
perations.
o officers of the general staff, senior a major, in charge of
ntelligence, records, foreign attachés, press correspond-
nts.
officers of the general staff, senior a major, in charge of
nes of communication.
naval officer, a commander. This officer is exceptional,
d his presence was due to the naval artillery used in the
ge.
chief medical officer, a major-general.
hief intendant, a major-general.
hief of artillery, a major-general.
hief engineer, a colonel.
amp commandant, a major.
djutants, senior a lieutenant-colonel, in charge of
ine work.
xpert in international law, Doctor Ariga, member of
foreign office. This official was attached at Port
ur only on account of the international questions
ng in connection with the siege.
of official interpreters, having assimilated rank from
to lieutenant, and speaking various languages, Eng-
erman, French, Russian, and Chinese.

general staff officers of the Japanese armies reign education, chiefly German and French, peak one or the other of these languages, but Japan having modeled her army along Gerlines, these countries have naturally been seper ones to which to send her army officers.

Naval officers, on the other hand, speak English alm versally and many have received training in England.

With one single exception, all the army and line commanders were from the infantry branch of the The exception is the Eleventh Division, whose firs mander, General Tsuchiya, was wounded at Port Arth was succeeded, temporarily at least, by General Sa an engineer officer. The higher leaders are all soldiers old school who have won their spurs in the civil wars of them going back to the time of mediæval weapons. W lacking perhaps in the refinements of modern militar cation, they are natural-born soldiers, possess stre character, and are idolized by their men. The per character of the leaders, in connection with a thor trained and up-to-date general staff, presented an idea bination for handling large masses of troops in the fiel

JAPANESE ADMINISTRATIVE GOVERNMENT OF OCCUPIED TE TORY.

In all the larger towns of the occupied territory a J nese administrative office was organized under an o detailed for that purpose. The object of the administr office was not to replace the existing civil administr under Chinese officials, but by cooperation with the l authorities to maintain order, establish confidence am the inhabitants, and to secure sanitation. The office d not administer justice and has no powers of punishm Among the places where administrative offices were ma tained were Port Arthur, Dalny, Haicheng, Liaoyang, M den, and Fakumen.

The workings of the Japanese administrative office may b illustrated by the case of Fakumen, a large town of so 20,000 inhabitants, which was the headquarters of the Thi Army during the last four months of the war. The adm istrative officer was Major Iwai, of the gendarmerie, ap pointed by General Nogi. Ordinarily the administrati officers were appointed by Marshal Oyama. Major Iwa reported to the inspector-general of the Third Army Étape and the latter reported either to General Nogi or to Marshal Oyama.

Iwai's duties consisted of investigating the condi-
ffairs among the inhabitants and of advising with
ese officials. If a thief or other malefactor were
; was sent to the Chinese officials for trial. Per-
ected of being spies were taken in charge by army
ers. Major Iwai's jurisdiction extended over a
8 miles from Fakumen, and his staff comprised 1
2 surgeons, 2 interpreters, 2 noncommissioned offi-
gendarmes.

pying the city the Japanese conferred with the
ıd arranged for the local military mandarin to
ity with his soldiers. (Fakumen is governed by
mandarin and is under the jurisdiction of the
ıgistrate).

ai cooperated and corresponded with the military
nd had power to compel the latter to obey his
in case of refusal, to arrest him and to send him
ıan magistrate for trial.

ras governed in town matters by a committee of
ens, under a president selected from their num-
ommittee, acting under Major Iwai, looked after
ı, for which purpose the town was divided into
districts, each again into three subdistricts.

imposed for violation of sanitary regulations
y so collected applied to expenses of sanitation.
epairing streets was charged against the abut-
who were also responsible for their mainte-
latrines were built at a number of points and
he citizens on assessments fixed by the town

vy work of street improvement was performed
Japanese soldiers, of whom some 500 were em-
or some time. Thereafter the citizens were
k out for the maintenance of the improve-
eet improvements consisted mainly in ditch-
nd in hauling in a top dressing of gravel from
nning through the town.

ts of better sanitation the Japanese adminis-
ntained a dispensary for the treatment of the
lisinfecting office after July 15, 1905. The
of 1 surgeon, 1 medical noncommissioned

officer, 2 hospital corps men, and a few Chinese cool disinfecting office had a cart, which distributed li carbolic-acid solution.

Each main sanitary district was visited daily by a su or a noncommissioned officer, and three Chinese mem committee.

Efforts were made to reduce the pest of flies by th improvised fly traps and a concoction made by poisonous weed with rice.

Prices of staple supplies and of labor were fixed Chinese committee and, after approval by Major were posted throughout the town, being binding a buyer and seller. The following was the scale of pr July 12, 1905:

	Yen.		
Cart, per day	5.50	Mutton, per catty (1 pounds)	
Cart, per li (2½ miles)	1.20	Ducks, each	
Mechanics, per day	.70	Chickens, according size	
Coolies, per day	.60	Eggs, each	
Pork, per catty (1⅓ pounds)	.20		
Beef, per catty	.25		

For the purpose of sanitation, two committees were for to regulate all sanitary matters:

1. A committee of general sanitation composed of M Iwai and staff, with surgeons and officers from the mili units.

2. A Chinese committee, appointed by the first comm The members of the Chinese committee wore a disting ing badge, and had a distinguishing flag over their office.

In houses occupied by troops the senior officer or se was held responsible for the enforcement of sanitary reg tions. In houses unoccupied by troops the Chinese comm tee was held responsible for cleanliness and sanitation.

The principal sanitary regulations prescribed by the committee were as follows:

1. Every room to be properly cleaned and swept and all wind and doors to be left open for ventilation during good weather.

2. All yards and outhouses to be kept clean and refuse emptied pits.

3. All stables to be kept clean.

4. Good locality selected for latrine in each house with hole at le 3 feet deep. Dried earth or ashes to be thrown in after use.

Sanitary committee must constantly supervise public latrines and
rt any cases of neglect to the Chinese committee responsible.
oolies must be employed to keep latrines clean.
ach household in selecting refuse pits must pay attention to the
owing points:
a) It must be put in a hollow outside the city where no drainage
n it can reach the town.
b) The number of refuse heaps must be limited to the require-
nts.
c) A notice in Chinese and Japanese to be placed over each refuse
p.
. Every householder must carry his refuse to the dust heap, where
will be burned if possible. (Dust carts were organized to carry off
use from each house.)
8. Each householder must sweep his part of the road daily, and
en rain has ceased sweep off any standing water.
9. A ditch must be kept each side of the road, care being taken that
drains properly. Each house is responsible for the repair of the
ad in its front.
10. Anyone committing a nuisance on the streets will be arrested
d taken to the governor's office.
11. All ground near wells must be kept clean and care taken to
event drainage into them.
12. Any case of sickness among Chinese to be at once reported to the
ministrative office (Major Iwai).
Rules 2, 3, 7–12 are under the supervision of the Chinese committee,
ho will be responsible.

The following additional regulations were also made by
he Chinese committee:

1. Every dog must have a label with owner's name. Untagged dogs
ill be killed.
2. Mad dogs will be killed at once. If a mad dog bites anyone the
wner will be punished.
3. Pigs must be kept in a sty. Owners of stray pigs will be severely
unished.
4. Anyone committing a nuisance will be liable to a fine of between
0 sen and 5 yen. If unable to pay they will be employed as coolies.
5. Every man must select places for a latrine and refuse pit and
eep these places in order or be punished.

As a consequence of the sanitary measures instituted by the Japanese, the town was greatly improved and the streets were maintained in a passable condition throughout the rainy season. The numerous cesspools formerly existing in the compounds were drained and many of them filled in with sand and gravel. Quarters occupied by the troops were not only rendered sanitary, but were also beautified by the soldiers, who constructed miniature gardens with wild flowers an gathered from the surrounding hillsides, so that th pounds took on a very attractive and refreshing appa contrasting strongly with those occupied by the Chi whom cleanliness and aesthetic surroundings poss charms.

The dog regulations resulted in weeding out th worthless and repulsive curs with which every town a lage is cursed. The proceeds from the sale of the were applied to street improvements and sanitation. than 5,000 dogs were reported as having been destr Mukden.

In fact, the physical transformation of Fakumen the summer of 1905 was nothing less than wonderful. the example set by the Japanese produces any lasting upon the future cleanliness of the inhabitants it wi great blessing.

For convenience in transacting business with the in ants the Japanese put in circulation a special form of notes in denominations of 10, 20, and 50 sen and 1, 5, an yen. These notes were redeemable in silver at any adm trative office and were freely accepted by the inhab both of Manchuria and Korea.

MANCHURIA AND ITS INHABITANTS.

South of Chinchou the Liaotung Peninsula is exceedi broken and hilly, with maximum elevations of 1,0 above sea level. The hill formations are irregular and involved, with no well-defined direction for the ridges. hills are quite bare and the slopes very steep, with rock crops, usually granitic, at times pure quartz. The s sandy and sterile and the crops poor as compared with farther north. Some Indian corn is grown in this se but its quality is poor. The staple crops are kaoliang millet, as elsewhere.

From Chinchou northward to Pulantien the country more open and the hills lower and with gentler slo The soil is a reddish sandy loam and more fertile than to south.

From Pulantien northward the topography becom gradually more rugged and the hills higher and with a w

ırtheast and southwest trend to the ridges. After
əlissu elevations become less and the country once
e open until we reach the plains of Hsiungyo-
ch extend unbroken to Kaiping, where the ground
ly to the divide which marks the watershed of the
Tashihchiao we are fairly in the plain of the Liao,
ıds unbroken to Tiehling.

ering the plain of the Liao the railway follows its
, hugging the foothills of the mountain chain to
ccasionally this mountain chain throws out sub-
s at right angles, forming ridges, which were
he Russians as defensive positions as they fell
he railway. To these subsidiary ridges belong
nshantien, which the railroad pierces, and the
ıng, known as the Shoushanpu, which the rail-
its western end.

e Liao River and the railroad as far north as
ountry is perfectly flat, without the slightest
ation. From the Shoushanpu and Anshantien
have an uninterrupted view for 50 miles to the
the course of the Liao by the numerous junks,
ils stand out conspicuously in the somber gray

he river breaks through one of the subsidiary
ain mountain chain to the east. This spur
west of the Liao and spreads out into an
ıass with maximum elevations of 700 feet
the country on the right bank of the river
great bend at Tiehling and an unknown
m Fakumen into Mongolia.

ing, between the river and the railroad, lies
ıd fertile Kaiyuan plain, which extends
ınce of 30 miles with a greatest breadth of
thern end. North of this plain the ground
s undulating as far as Changtufu, where
ge ends.

the plain of the Liao the soil becomes re-
ınd the entire plain is one unbroken field
ıe summer months. The same is true of
and the hilly country west of the Liao

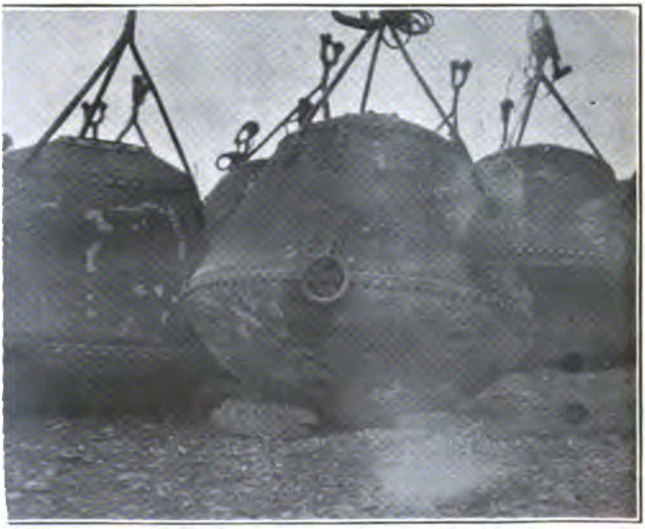
about Fakumen. If anything the crops grown slopes and undulating valley floors to the nort luxuriant than those of the Liao plain. Every foo able ground is under cultivation, even on stee The staple crop is the Chinese corn or kaoliang, called large millet. It is a species of sorghum, an seed cluster develops at the top can hardly be dis from Indian corn. Its stalk is more slender and greater, averaging at maturity about 11 feet. B measurement stalks of from 13 to 14 feet have be Kaoliang is planted in rows about 2 feet apart, the first sown quite thickly and after sprouting being th so as to leave the plants about 1 foot apart in the ro ing from the size of the end clusters and the cultivation, the yield per acre must be something The seed is small, reddish brown, and about the si 2 shot. The grain forms the staple food for man a being eaten as a porridge by the former and fed wit straw to live stock.

Besides being the principal food staple kaoliang many other wants of the natives. From the outer the stalks are woven the mattings which find so ev application in the household and in the construction of bins. The stalks are used for building inclosures tha and partitioning walls, being plastered with mud in th case. From the grain is made the "samshui," or C whisky. But, most important of all, the stalks and form the principal fuel in a country which is prac treeless and where winter temperatures of 30° F. b zero are common. To economize fuel, the kitchen are led under a mass of brickwork along one side of th ing room, and this mass of brickwork, called *kang*, serve both bed and stove.

Next in importance as a crop is the small millet, the as is grown in America for hay. Its seed, which form luxuriantly in heavy heads, frequently 6 inches long ground into flour, while the straw forms the principal forage for live stock.

Almost as important as the small millet is the Manchur bean crop, the chief article of export. The Manchur bean is a small white, round bean, resembling a pea

OLIANG FIELD, KAIYUAN PLAIN, SEPTEMBER, 1905.



SSIAN MINES FROM KERR BAY, NANSHAN.

growing on vines which reach a height of 2 feet. :he crop matures the luxuriant leafage drops off, the naked vines with their numerous little pods, ıtaining from 2 to 3 beans. The vines are simply p and the beans flailed out. This bean is grown ıorth of Mukden, and forms a large item of the the Kaiyuan plain. From the bean is expressed nd the residue, called bean cake, is used as horse xported, via Yingkou, to Japan and south China, s used as a fertilizer.

the crops above named, hemp, buckwheat, cotton, ıd indigo are grown. The first two are of some e, hemp furnishing the natives with material for ›pe and cordage, and buckwheat being used for acture of the excellent Chinese macaroni.

e intense cultivation practiced by Chinamen gen- soil would soon become exhausted were it not Every particle of manure or household waste garnered during the year in the village manure spread on the fields when the season for planting common sight is old and feeble men and little › young to work in the fields, trudging along the arefully picking up all the droppings from the ls.

ıitants of Manchuria are mainly Chinamen who ted from the northern provinces in compara- years. The original Manchu population, the nd present ruling class in China, are repre- ınchuria only by the bannermen, a species of › are designed to maintain order under the but are apt to ally themselves with the hun- r bands, which infest the country, more espe- he Mongolian border. These bannermen, al- nchu origin, have lost their language and are ınd purposes Chinamen in their speech, dress, They are designated as red, white, blue, or ıen, according to the color of their uniforms. d with all manner of obsolete weapons from to Russian Mausers, but have generally no Vith their banners and gaily colored uni- ent a picturesque appearance, but are worthless as soldiers, being without training and cowardly. Many of them entered the service of the Russians and Japanese as volunteer cavalry or as spies, being paid 30 yen or rubles per month. The original Manchu language seems to have entirely disappeared save for the inscriptions on tombs and monuments, where it generally appears side by side with the Chinese idiographs, from which it is easily distinguishable.

Tombs and monuments are indeed the sole remaining evidences of the departed Manchu and Mongolian conquerors, who have been entirely absorbed by the subjugated race of Chinamen. Chief among these monuments are the famous Mukden tombs, which are too well known to call for further mention. Many other tombs, however, exist along the Mongolian border, most noteworthy being those at Kunyuling, Laoling, and Hsiaoling, 8 to 10 miles west and northwest from Fakumen.

Neither side can be said to have derived any valuable assistance from their employment of bannermen and hunhus. As spies they possessed neither skill nor ability to judge of military situations, and those who escaped having their heads cut off or being shot brought little information of value. That at least was the estimate of the Japanese. Many spies were executed by the Japanese during the summer of 1905 in the Third Army, and scarcely an evening passed that a batch was not decapitated at army or division headquarters.

The inhabitants of Manchuria live in low one-storied houses, surrounded by walls forming compounds, which are entered through a gateway which can be strongly barred by heavy wooden gates. Not infrequently the more important compounds are arranged for defense, having projecting corners to secure flank fire and loopholes or crenelations along the walls.

That the hunhus are no idle jest was demonstrated by their raid on the village of Wanghutun, about 5 miles west of Fakumen, on May 18, 1905. The villagers having failed to respond to a contribution of 15 pounds of silver levied by the robbers, a portion of the village was set on fire in sight of the headquarters of the Third Japanese Army. General Mishchenko's cavalry was making a raid around the left flank of the Japanese line at the time, and it is generally believed foray of the hunhus had some connection with the movements.

e southern part of the Liaotung Peninsula the nd walls are of stone, which is abundant. In the the Liao and northward the poorer houses and walls ud and the better class of gray brick. Chinchou, Haicheng, Liaoyang, and Mukden are walled towns, being brick and of great height and thickness, with al gates, usually one on each face. The bulk of the n, however, lives in small villages, averaging from houses and with from 500 to 1,000 population. age of any importance has its temple, usually the ntious structure in the place and often ornately carvings and mural paintings, but too often perfall into decay, for the Chinaman seems never to hing that he has once built. Each house or family is, comprises a considerable number of dwelhe custom of sons continuing to live with their er marriage. The family of the owner of the ied by the attachés at Fakumen counted 37 memccurate census of the population of Manchuria have ever been made, and it has been estimated 00 to 12,000,000. From the number of villages all the extent of region seen by me and the ner in which the Chinese live, I am inclined to the higher figure is more nearly correct. A accurate map of any portion of the country armies operated will serve to show how numeres are. In fact, one can hardly go half a mile out striking another village in some direction. ight of the houses and their gray color, har the soil, makes it difficult to pick up the viluntry until one is almost upon them. Usually, w cottonwoods or willows on the horizon is f a settlement. Nothing more somber or submagined than a Manchurian landscape save mmer months when the luxuriant crops lend ghtness to the coloring. A gray soil, gray ple all dressed in indigo-dyed cottons—there bsence of all bright or warm colors which resses the beholder.

There are no fences or other inclosures to the fields, wh are cultivated in common by the villagers. Isolated fa houses are exceedingly rare save toward the Mongolian der, where the ground has only comparatively recently taken up for cultivation.

All that portion of Manchuria covered in my travel treeless save for the few cottonwoods and willows mainta as ornaments for villages and burial grounds. Looking the distance, one could note a fringe of trees on the hor giving the impression of extensive woods, but on nearer proach they were found to be simply the projection of few village and cemetery trees. Such trees as existed found in the plains and valleys, the hilltops being invari bare.

The great bulk of the population is engaged in farm Their implements are exceedingly primitive, and all la is done by hand or by farm animals, from the planting the seed to the grinding of the grain. The plow is a ro wooden frame with an iron share, which throws the ea equally to both sides like a cultivator.

In planting kaoliang or millet a furrow is first traced the seed sown by hand or spread by an ingenious arran ment of a gourd with a bunch of straw projecting fro spout. By suitably regulating the compactness of the str and tapping the gourd the seed is made to flow out eve After the seed is down a furrow is run on each side, coveri the seed, and the planting is complete. The furrows nev run straight, but in a sweeping curve. The harvesting all done with the native sickle, a painfully slow proc Thrashing is accomplished on a prepared smooth clay fl by flails or by driving a donkey with a stone roller over seed heads. The grain is winnowed by the wind, of whi latter there is an abundance.

To supply the necessary labor for cultivating and harvesting many Chinese coolies annually flock to Manchuria fro the northern Provinces during the summer months and return again for the winter.

The country abounds in live stock, there being many fin ponies, mules, donkeys, pigs, sheep, and goats. Cattle ar but sparingly found in Manchuria, but Mongolia seems to b well supplied, and many herds of excellent oxen were encouneing driven into the lines to supply beef to the Very little poultry was seen, but this may have been e armies which occupied the territory.

habitants appear to be good-natured, industrious, eable people. The men are tall, strong, and robust, women not unprepossessing Above all things, the n is domestic, and his chief aim in life appears to ass wealth and to rear a large family. In this pect he seems to be fairly successful, if one may m the swarms of children seen on the streets and in ounds. In spite of their filthy surroundings, un- its, and vermin-infested houses, the natives are y healthy looking and, judging from the number ople, a long-lived race. Although apparently in- o their surroundings and to all principles of sani- houses of the well-to-do in the larger towns often evidences of refinement and taste, abounding in pieces of carved furniture, panels, screens, and es of bric-a-brac.

of the villages along the Mongolian border the ere probably the first foreigners ever seen, and ur presence aroused the greatest curiosity and Women and children fled precipitately around of walls or behind doors to watch the unwonted om their hiding places, while the men swarmed streets and crowded about us.

nd children were generally removed from the g between the lines and in the immediate sphere A common sight preceding and following battles gee families leaving their homes or returning to ng their children and household effects piled ese carts. But while women and children were l from the scene of danger, the men would con- tivation of the fields, often when under fire.

e of Manchuria is not unlike that of the Da- tana, with long, cold winters and short, hot he average annual precipitation is about 20 of it falling during spring and summer. The omes in July and August and is characterized n of showers, several of which may fall in one asional intervals of several days without rain.

During the fall and winter there is very little precipita and much sunshine prevails. During the autumn, winter, spring months high winds and dust storms are commo intensely disagreeable, the dust penetrating every cr and blinding and choking the traveler. Heavy frosts o at the end of September, and in October ice forms on water. At Liaoyang on October 8, 1904, ice over one-f inch thick was measured on still ponds and thereafter formed regularly every night. The summers, though are extremely favorable to growing crops, and but for circumstance Manchuria would not be the garden spot

In spite of the cold climate the inhabitants wear co clothes only. For winter wear their garments are pad and their number multiplied as the cold increases, be gradually removed with the advent of warm weather. M of the cotton used is still made on hand looms, altho most of it now comes from American mills, usually as pla uncolored sheeting, the natives doing their own dye Besides cotton goods, considerable American flour and co densed milk were seen in the larger towns, but very little in the way of American manufacture or products.

SUBMARINE MINES.

A nation which guards its military secrets so jealously a does Japan can not be expected to be very communicati concerning its submarine-mine system, and any informat on this point was out of the question.

So far as concerns the operations at Port Arthur, th mines employed by both sides were intended mainly fo injuring the enemy's ships in the open sea and involved th use of a class of mines not comprehended in the ordinary mine defense of harbors. These mines appear to have be floating mechanical mines strung on cables at intervals su that a vessel striking the cable would swing the mines agai her hull.

Besides the floating mechanical mines, both sides also em ployed fixed mines, the Japanese in the defense of their hom harbors and the Russians at Port Arthur, Dalny, and adjoin ing bays. At least two classes of fixed mines are known to have been used by the Russians, one the ordinary, well-known mechanical mine, with five projecting lead cylinders contain ch a galvanic element which becomes active when the /linder is bent or deformed by being struck by a vessel. such mines were planted in Dalny Bay and neighboring A group of these mines, removed from the near-by and stored at Nanshan, is shown in the accompanying raph. These mines have riveted cases, two spherical ts riveted to the frustum of a cone, the case being 30 igh over all and 30 inches diameter. The top dome 1½-inch brass-bushed holes for the mechanical lead d galvanic elements, while a 5½-inch loading hole is the side of the frustum near its top. The mine has les, and is moored by a three-eighths inch diameter oring rope. From small particles adhering to the the case, the explosive is either gun cotton or l.

of electrically controlled mine seen at Port Arthur eted case 3 feet high and 3 feet diameter at the wid- Like the mechanical mine, it was a frustum of a a spherical dome at the larger end. The case had g holes, one in the top 6½ inches in diameter and one om 9½ inches in diameter. The cable entered through oox on the side of the case. Instead of bales the rovided with two short chains to which the moor- ve-sixteenths of an inch in diameter, is attached. is to the interior arrangements were ascertainable. s were planted just outside the harbor entrance d from a point on the Tiger's Tail Peninsula, as e cables, which were visible at low water, where shore.

ird to details touching the mine-laying vessels *Yenesei*, which I was directed to ascertain and the former was found lying on her side in the dry dock, her smokestacks making an angle of th the horizontal. She is a stanchly built vessel 00 tons burden, about 300 feet long and 35 feet has twin screws, and, according to a Japanese in opening in the overhang at the stern through mines can be dropped while the vessel is under his feature could not be verified, owing to the sub- stern at the time of inspection. She is liber- with davits of very substantial construction and

Diagram of Japanese Machine Gun- Tripod Mount.

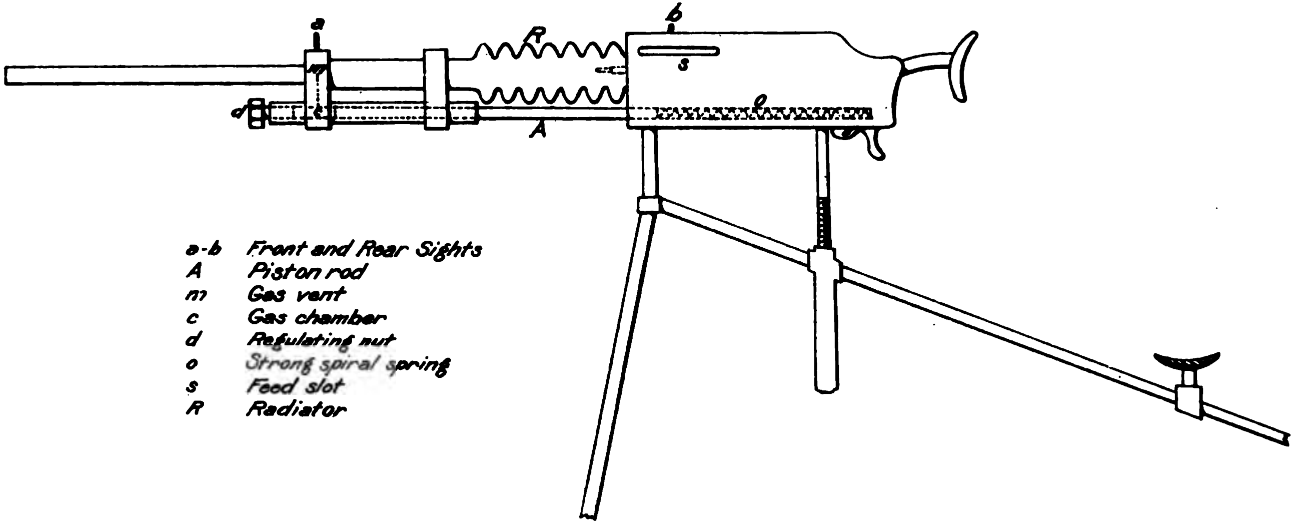
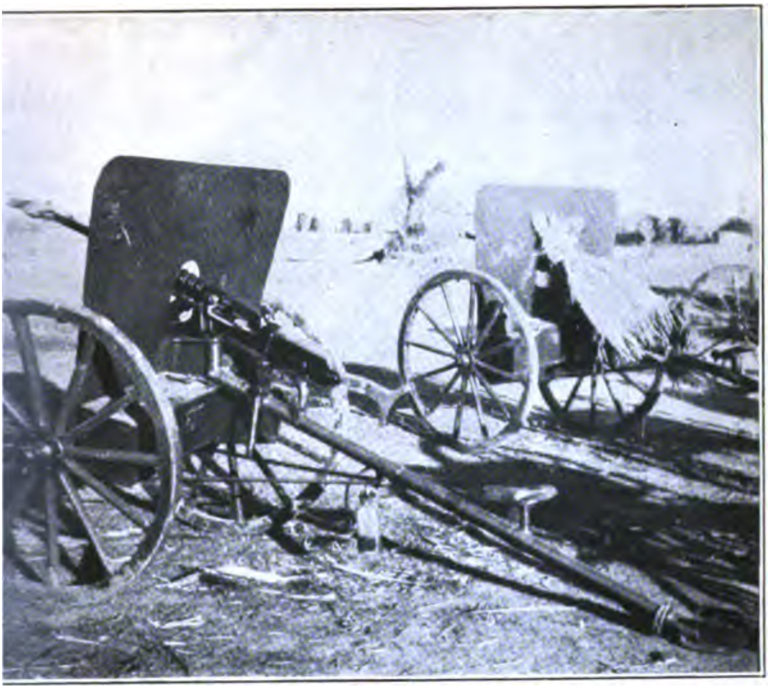
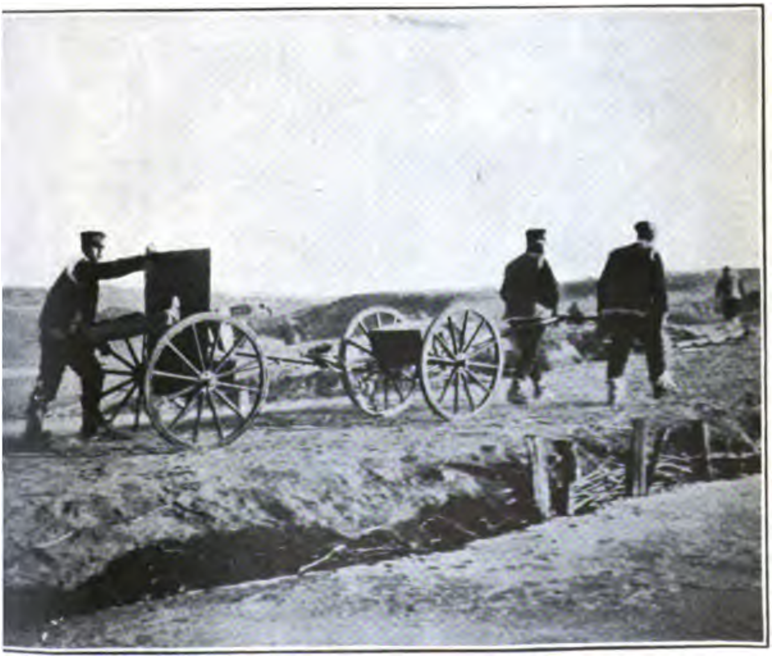


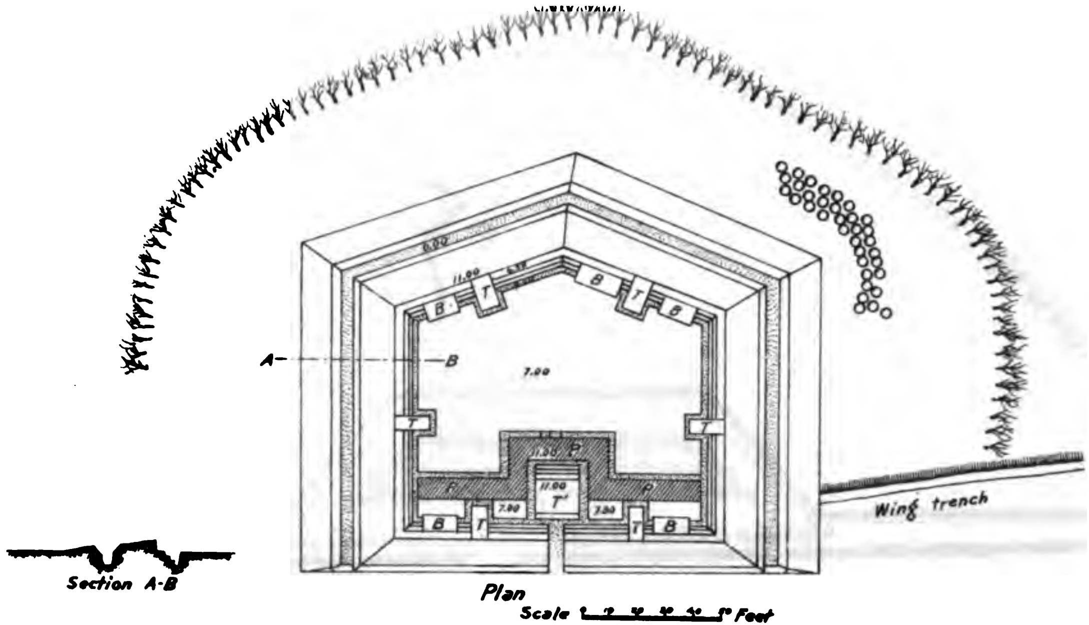
PLATE IV



33. JAPANESE MACHINE GUN.



34. JAPANESE MACHINE GUN.



B Bomb Proof
T Traverse
P Parados
T' Defensive Traverse

Joseph E. Kuhn
Maj. of Engineers. U.S.A.
April 1905.

PLATE VI

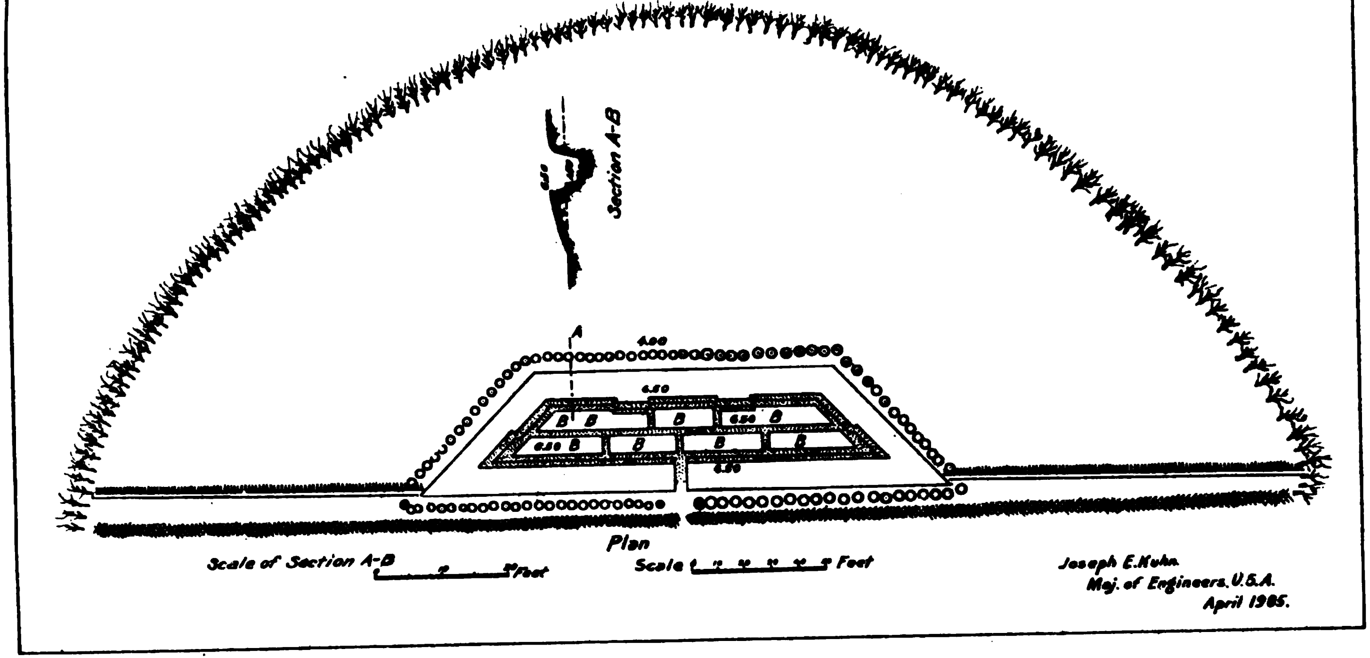
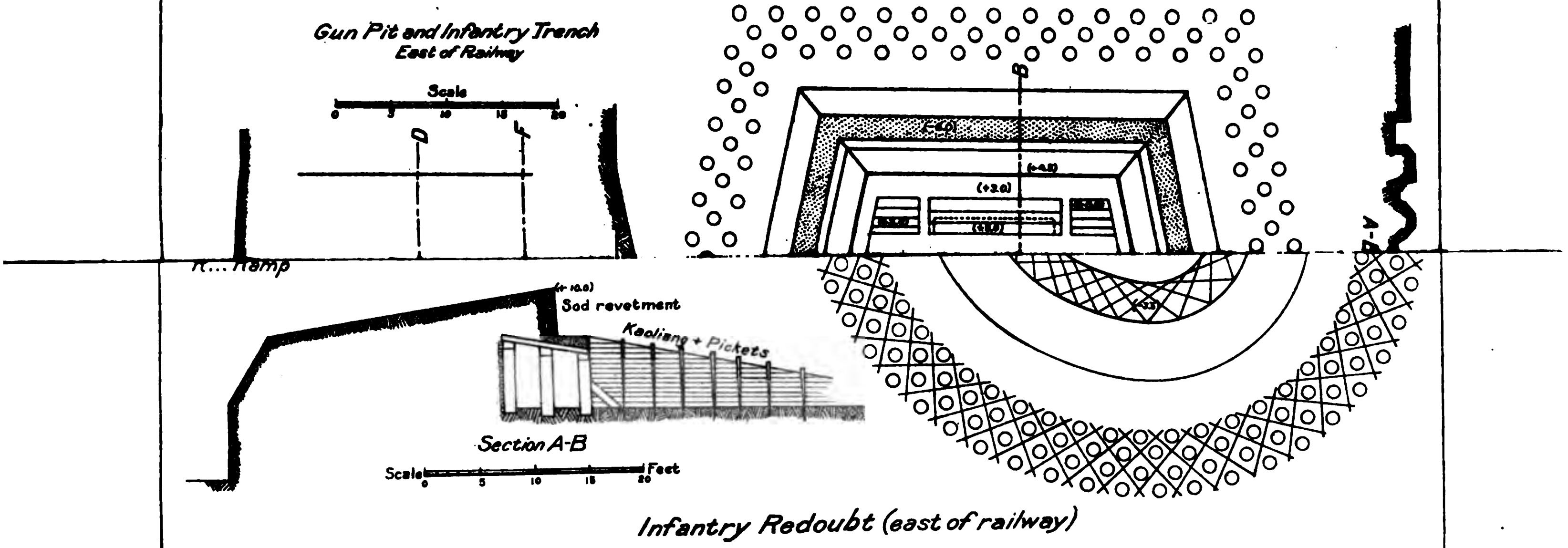

Section A-B
A
4.00
6.50
B
6.50
5.50
Plan
Scale of Section A-B
Feet
Scale
Feet
Joseph E. Kuhn.
Maj. of Engineers, U.S.A.
April 1905.

PLATE VII

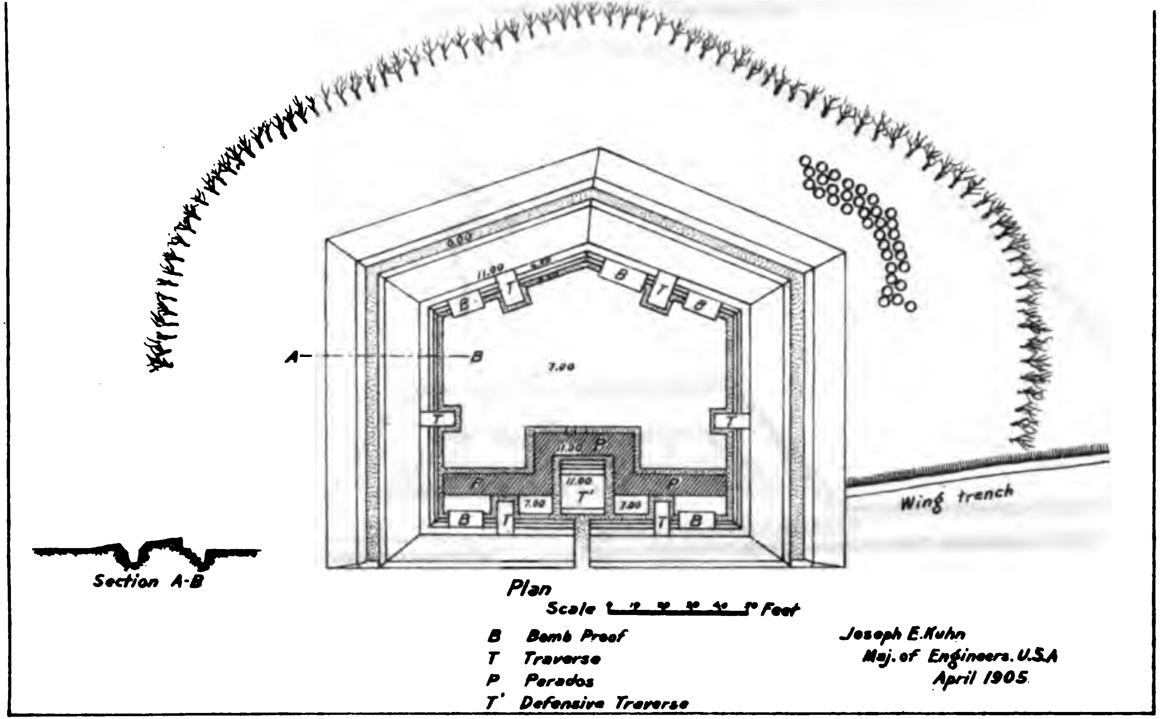
RUSSIAN DEFENSES AT LIAOYANG



Gun Pit and Infantry Trench
East of Railway

Infantry Redoubt (east of railway)

PLATE V


0.00
11.00
B
T
B
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A
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T
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P
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P
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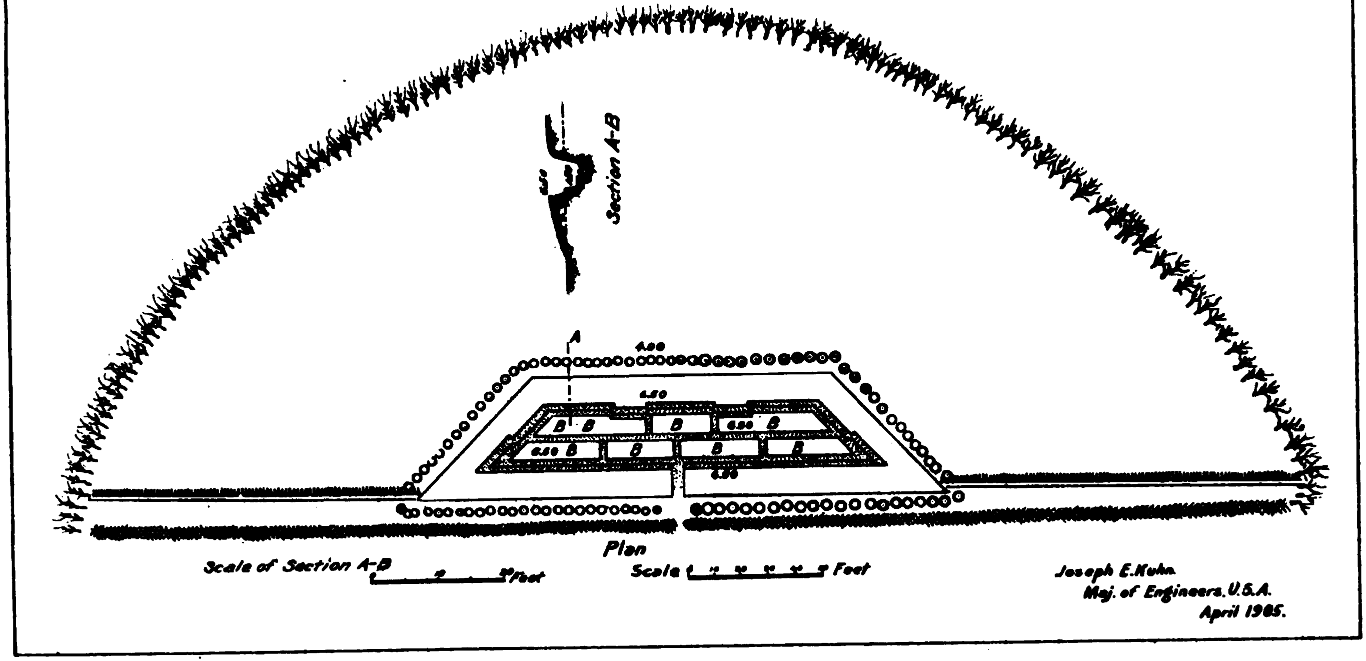
B
T
T
B
Wing trench
Section A-B
Plan
Scale 0 10 20 30 40 50 Feet
B Bomb Proof
T Traverse
P Parados
T' Defensive Traverse
Joseph E. Kuhn
Maj. of Engineers. U.S.A
April 1905

PLATE VI

Russian redoubt near Shahliantzu



Joseph E. Kuhn
Maj. of Engineers, U.S.A.
April 1905.

PLATE VII

ιok more of the character of siege works, the trenches ; very deep and provided with abundant bombproof and terproof cover.

e scarcity of timber and brush greatly limited the mate- available for revetment work, and sand bags were, in quence, extensively used for this purpose. Occasion- sod and stone and less occasionally pickets and kaoliang s were employed for revetments. Owing to the natural ιess of the soil slopes could be maintained at a steep ; in cuts without revetments of any kind, and many of renches were constructed in this way.

ctions of normal Japanese trenches on their fortified of resistance at Haicheng, Liaoyang, and north of Muk- ıt Kangpienhsien and Chinchiatun are shown on Plate In general the Japanese fortifications were character- by lower parapets, with flatter superior slopes, and r trenches than the Russian works, a portion of the ex- ted material being thrown to the reverse side of the h. The form of parapet adopted by the Japanese lends better to concealment, but the width of trench renders ore exposed to shrapnel fire. The greater width of h has for its object, of course, the securing of lateral nunication.

their lines north of Mukden near Chinchiatun the ınese introduced ditches along several portions of the t. These ditches were located 20 to 30 feet in front of ire trench and were flanked by field caponiers located at alients or reentrants and connected to the fire trench by ıken and covered passageway.

ıe ditches were about 6 feet deep, 5 feet wide at the bot- and with side slopes of 2:1 to 3:1. Machine gun case- s were also introduced along the parapet, their dimen- s being 8 feet wide by 10 feet deep by 3 feet 6 inches high, splinterproof cover some 18 inches thick. No projec- s are allowed above the fire crest excepting only the out stations, which are located on the most commanding ts a few yards in rear of the fire trench. These are made bproof and kept as low as possible consistent with having sighting slit overlook the foreground.

he Japanese trenches shown on Plate IX were intended narily for defense. In their attacks on the Russian positions, the Japanese firing lines, lines of support, and reserves frequently constructed hasty intrenchments as they advanced over the fire zone. These intrenchments were of the simplest form to give cover quickly, being thrown up with the portable intrenching tools carried by the soldiers and giving cover lying down or kneeling. They served to cover the successive advances of the infantry line, being occupied in turn by the firing line, lines of support, and reserves, and being continuously strengthened by the rearmost lines. Many of these light intrenchments were seen at Liaoyang, and from them the positions of the Japanese infantry at the different stages of the fight could be seen.

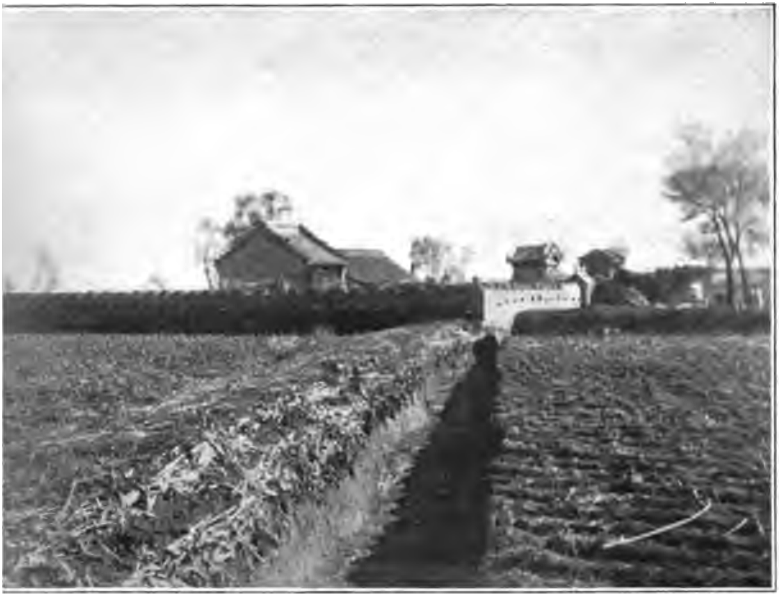
A feature of all the more elaborate Japanese trenches was the small berm, about 10 inches below the crest, designed as an elbow rest and to give greater steadiness to the rifle. This feature impressed me as possessing considerable merit. When practicable the Japanese always employed artificial concealment for their trenches, covering the freshly turned superior slopes with millet straw, bean vines, or kaoliang stalks gathered from the adjoining fields, or even planting a row of kaoliang stalks in an upright position as shown in the photograph herewith.

In the matter of concealing their works the Japanese took infinitely more pains and displayed a far greater skill than the Russians.

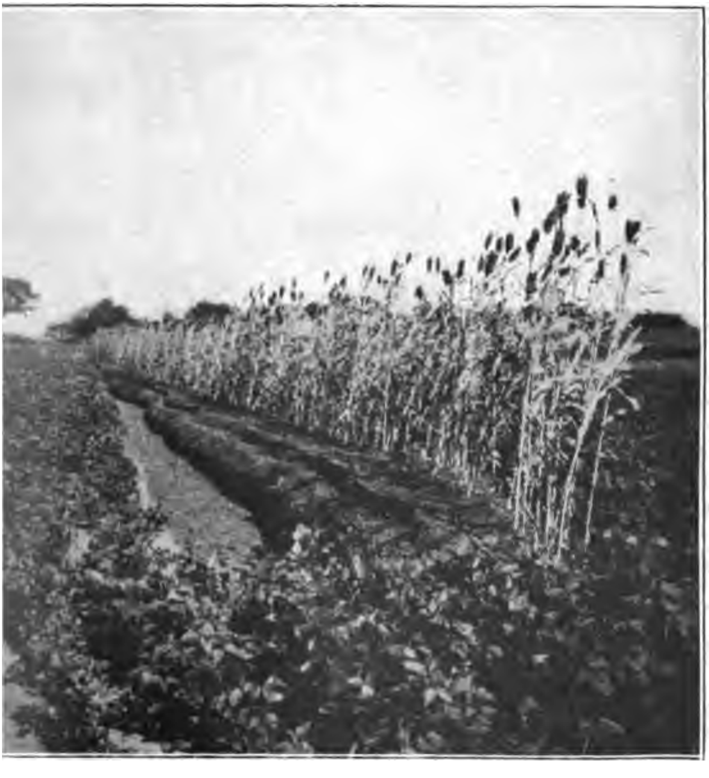
When loopholes were used in field works they were made most frequently with sand bags or sod. When available brick and stone were also employed.

At Liaoyang and Haicheng the Japanese trenches had little mounds of mud on the superior slopes, as shown in Plate IX. In the absence of more suitable material these mud mounds afforded a simple and fairly effective form of head cover.

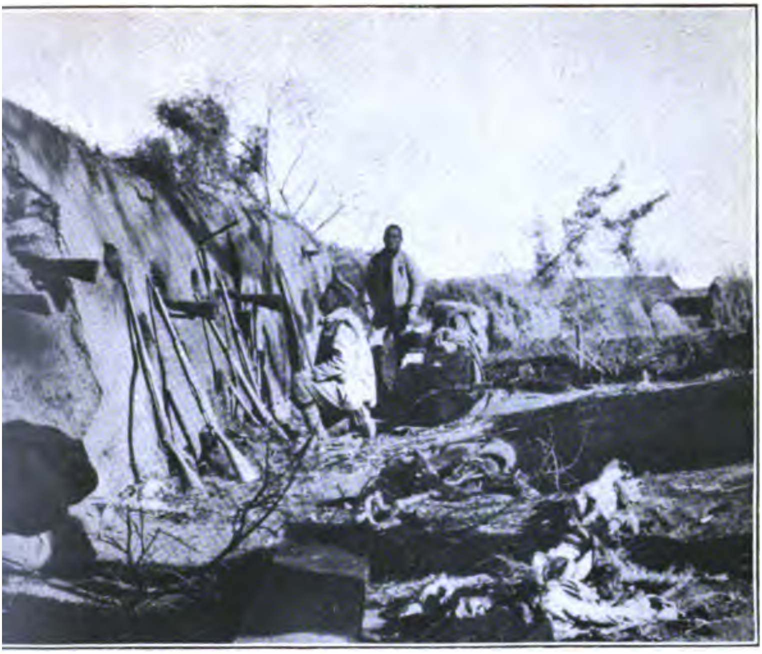
The numerous villages which dot the plains of Manchuria were the scenes of many severe combats, and by the nature of their construction lent themselves well to purposes of defense with comparatively little preparation. The outer inclosing mud walls are usually from 6 to 8 feet high and 2 to 3 feet thick at the base, sufficient to keep out a rifle bullet except possibly at very close range. These walls could be



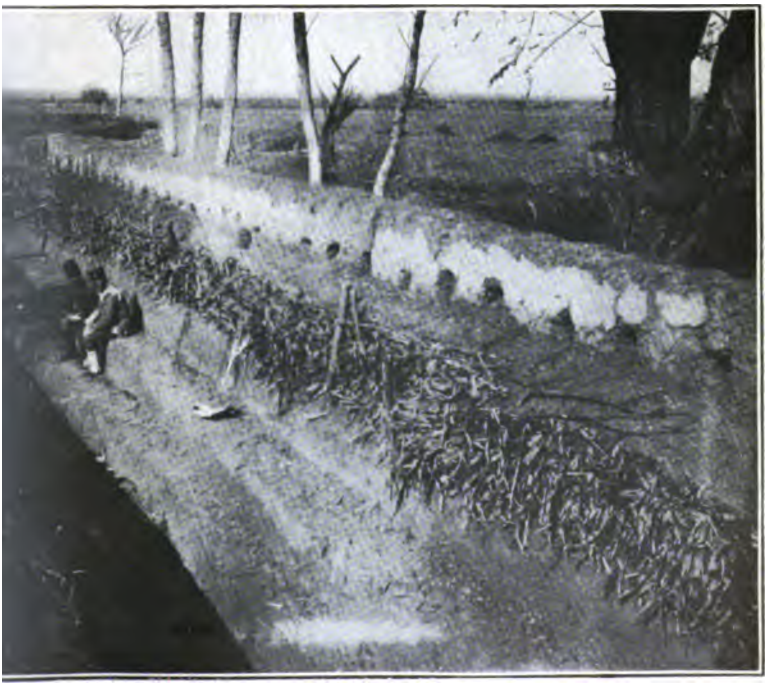
37. LITAJENTUN, PREPARED FOR DEFENSE, NEAR SHA RIVER.



38. JAPANESE HASTY TRENCH, LIAOYANG.



39. PREPARED WALL, LINSHENGPU, SHA RIVER.



40. PREPARED WALL, LAMUTUN; SHA RIVER.

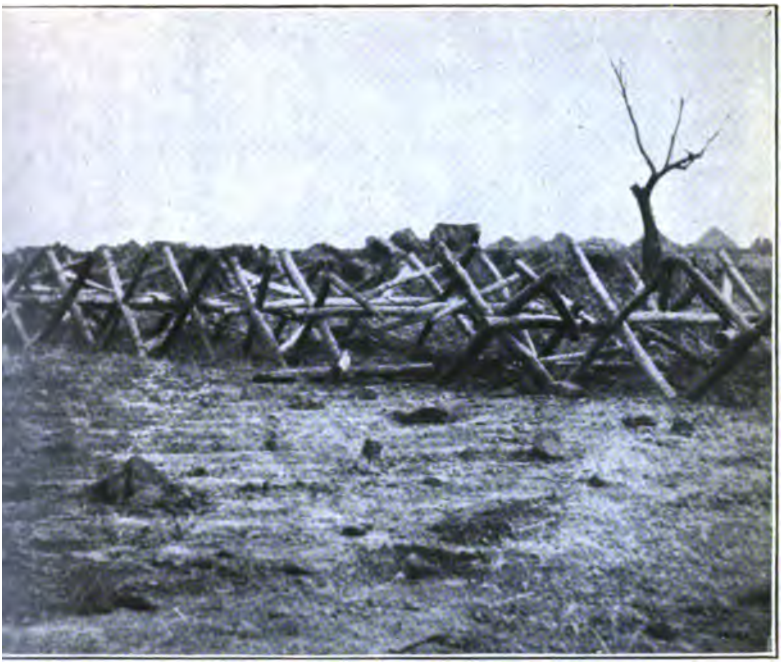
led or crenelated quite easily and quickly to give one tiers of rifle fire with all needful cover against in- and artillery fire, excepting only high-explosive shell. ccompanying views show some of the arrangements yed in fortifying villages.

rhead cover along the fire line was not generally used field works, although very common at Port Arthur. ew cases where the lines were held for a long time in roximity, as on the Shaho, overhead splinter proofs onstructed.

he matter of obstacles the Russians showed a decided ction for the deep military pit constructed strictly t-book lines, each pit with its sharpened stake at the . Nearly the entire front of the Shoushanpu position vered with a triple and quadruple row of these pits, ll the redoubts of the inner line were similarly sur- d. At the lowest calculation the development of the lines of deep military pits in front of the Second and Japanese Armies at Liaoyang must have exceeded 4 miles long of four rows. The labor expended form of obstacle was something tremendous and, of its comparative inefficiency, can hardly be said been well expended. The deep pits were usually by a low wire entanglement made of smooth wire urmountable.

entaglements, both low and high, of the regulation f construction, were frequently employed, but being built (stakes weak and insufficiently driven) and wire being generally used, the obstacle was far from effective as it can be made. In this, as in other mat- e deficiency of suitable material was mainly respon- The wire employed was largely galvanized-iron tele- vire.

tis was but sparingly employed, owing to the absence er and the necessity of reserving the available supply re important purposes. The old-fashioned stone e was also used by the Russians, notably at the end of Shoushanpu ridge where a number appear been fired with some success. Ordinary earth mines pear to have been used in the ditches or foreground



41. RUSSIAN "TRESTLE" OBSTACLE, LINSHENGPU, SHA RIVER.

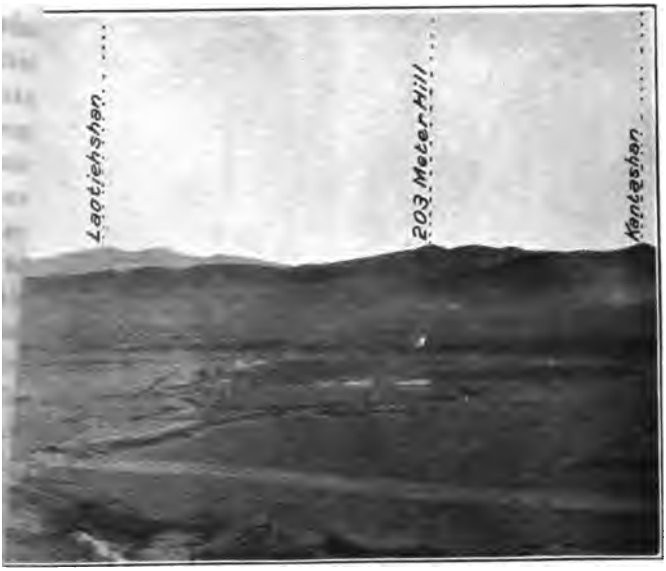
42. JAPANESE "TRIPOD" OBSTACLE, LINSHENGPU, SHA RIVER.

irregular hill mass at an average elevation of 2 In rear of the line of forts and advanced batteries t continues to rise, attaining a maximum elevati meters before dropping away quite sharply to t the valley in which the old town lies.

The western sector consists of two lines of works line of forts and batteries having its right flank on Hill and running thence along the flank of the Forts Antzushan, the Taiyangkou forts and Fort or Hsitaiyangkou, to the sea at the western end of t Tail peninsula. This line encircles the new tow tance of about a mile. The outer line of the west starts from the inner line at Hsiaoantzushan and r through Itzushan, Long Ridge, Namakayama, a nates on 203-Meter Hill. With the exception of there are no permanent works on the outer line.

Fronting the ridge upon which lies the eastern defenses and generally parallel thereto at a distance miles runs a ridge of heights attaining a maximum of about 800 feet at Artillery Hill and Hoshan. the two ridges lies a rolling, cultivated valley, with village of Shuishihying on the main road from Port to Chinchou. This valley runs across the Liaotung sula from sea to sea, the western end terminating on Bay. In the eastern end of the valley lies the two hills, Hsiaokushan and Takushan. A divide runs a floor of the valley at Kantashan, the drainage being west from this point. Hill slopes and valleys are up and intersected by numerous dry water courses or The Japanese lines of investment were located on th ridge of heights and crossed the valley at Kantashan ning thence through 174 Meter Hill and returning to Bay.

The topography of the defense lines is admirably a to the purpose. The lines of detached forts and ba occupy a series of knolls and heights in close defensiv tion to one another, affording complete command ov ground in front, and sweeping the immediate slopes front and cross fires. The heights in rear afford good tions for artillery and sweep the intervals in the line of The highest peaks afford excellent points for obser


Laotiehshan
203 Meter Hill
Kantashan

stern sector of defense the advanced hills and ridges .cellent defensive positions which were utilized by .ians (Long Ridge, Namakayama, 203 Meter Hill, ar Hill, Kantashan). In the eastern sector of de- e old Chinese wall, which runs immediately in rear ine of detached forts and batteries, serves as a con- enceinte from which the flanks of the forts and the between them can be swept with fire. The reverse of the inner ridges afford good cover for reserves and s. The principal disadvantage of the topography, is concerns the defense, are the numerous nullahs which ct the valley and run up the slopes close to the forts, ng troops to approach quite closely under cover. The nity of the parallel ridge fronting the Russian lines lso a disadvantage in that it afforded an excellent position for the Japanese siege artillery, cover for troops and lies, and good points for observation.

THE JAPANESE PLAN.

ne Japanese plan contemplated an attempt to capture fortress by open assaults. This local conception owed its in to three probable causes, as follows:

The Japanese, as followers of the German school, were loubt influenced by a certain class of writers who have inced the theory that a fortress consisting of a line of ched forts could be taken by assault with ultimate econ- in time, life, and money.

The success of the Japanese in the China-Japan war of -5, in which Port Arthur was taken by open assault, ther with their recent successes against the Russians. dentally it may be mentioned that both General Nogi his chief of staff had participated in the capture of Port nur in 1894.

The desire to save as much time as possible in disposing he Russian Port Arthur fleet and in freeing General i's army for use in the field operations in the north.

ut whatever the governing cause, the Japanese decided n an open assault, selecting the front of the Panlungshan s for their attempt. As a preliminary to the general ult it was necessary to capture the advanced Russian positions at Hsiaokushan, Takushan, and Kantashan, which would otherwise bring reverse fires upon the assaulting columns.

Takushan and Hsiaokushan were assaulted and captured between August 7 and 9. Kantashan was captured by the First Division on August 15, with the assistance of one Kobi brigade, the artillery brigade, and three batteries of field howitzers. With the capture of Takushan the rail head was advanced to Changling station (about 7 miles north of Shuishihying), which became the main provision depot. Ammunition and siege material were carried by rail as far as Kuochiatun, whence they were distributed by field tramways. A line of naval guns, six 12 cm. (4.7 inches) and fourteen 12-pounders, was set up west from Naval Hill. Besides the naval guns and field mountain guns the Japanese also possessed some 15 and 12 cm. field howitzers and possibly other siege guns, but their number at this stage of the siege was not ascertainable. The fire of the naval guns was directed from an observatory on Naval Hill, using hyposcope and plotting chart.

For the general assault which was now to follow the First Division was posted on the right, the Ninth in the center, and the Eleventh on the left. Under cover of the nullahs and growing corn, which covered the fields in the valley, the Japanese pushed forward their advanced troops to the foot of the slopes leading to the forts selected for attack. The assault was inauguarated August 19 by an attack of three battalions of the First Division against Fort Kuropatkin. A part of the work was captured during the night of August 19–20, but on the following day at 3 p. m. the Russians drove out the Japanese garrison of some 200. On the extreme right flank 174 Meter Hill was captured on the 26th.

The Ninth Division, to which had been assigned the assault on the Panlungshan forts, commenced its attack at 4 a. m. August 21. From the cover of the nullahs, which closely approach the foot of the slopes, a series of assaults was delivered against the East Panlung during the 21st. All these assaults failed. During the night of August 21–22 the assaults were continued, but without success. Meanwhile companies and battalions were being wiped out, and the situation was becoming desperate. On the 22d the question of abang the assaults was under consideration, but General ohe, commanding the Sixth Brigade, determined to one more attempt, and mustering a storming column— y survivors from previous assaults, many of them ded—in the shelter of the nullah, moved against the and carried the same. By noon the greater part of the was in the hands of the Japanese. Meanwhile two 'e companies, which were coming up to support the at- found themselves under an annoying flanking fire from Panlung and, on the initiative of the senior captain, an assault and captured this work.

conversation with Major Sukiyama, the sole surviving of the Ninth Battalion of Engineers, I gathered the ing details regarding the capture of East Panlung:

jor Sukiyama, then a company commander, took part assault with his company, of whom only 6 survived. wire entanglements were cut in three places by the eers, but the Russians trained their machine guns on ts and checked all attempts to get through. Engineers then sent forward with mines (10 kilos of high explo- in bamboo) to destroy the machine-gun caesmates. men crawled under the wire entanglement, avoiding ts, and reached the outer slopes of the parapet, only to he machine-gun port too small for the insertion of the . A smaller mine of 1 kilo was then brought up and in the port, enlarging it, after which the larger mine laced and fired. A bombproof was likewise destroyed nes after two trials, the fuse failing at the first attempt aving to be relighted. By reference to Plate XXXVII be observed that the nullahs on either side of East Pan- pproach this work quite closely. The main portion of saulting columns used the eastern nullah and deployed it at a point less than 200 yards from the parapet. elow the entanglement there is a bit of dead ground. the Japanese troops could secure some shelter lying The Russians made a counter attack from East Pan- n the 21st, but were driven back, the fighting being hand d, according to eyewitnesses. After the occupation of Panlung the Japanese engineers made a lodgment over- g the crest. This lodgment proved very useful in ng a desperate counter attack which the Russians delivered from the Chinese wall during the night of Augus 22–23. This attack was repulsed with heavy losses to th Russians, who thereafter abandoned any serious attempt at the recovery of the Panlung forts.

The main credit for the capture of these works is du to the Seventh Regiment, whose 3 battalions lost from 8 to 90 per cent of their strength. Only four officers i the whole regiment remained unwounded. General Baro Oshima, commanding the Ninth Division, informed me that Corporal Hatta of the engineers was the first man to enter the East Panlung, and I later had the pleasure of meeting this brave man, who was one of the few survivors of his battalion.

On the night of August 23–24 the Japanese delivered an assault against the Chinese wall, Wangtai, and Ridge H with one brigade from the Eleventh Division. The Chinese wall was carried and the assaulting column mounted part way up the slopes of both heights, but the concentrated fire from the front, flanks, and even rear effectually checked the advance. The positions reached by the Japanese in this attempt were plainly marked by their dead, who remained unburied until after the capitulation of the fortress. The slopes of the Panlungs, the ground between them and the Chinese wall, and the slopes of Wangtai and Ridge H were literally sprinkled with skeletons in khaki uniforms, many of whose skulls, following the lines of least resistance, had rolled down the slopes and gathered here and there in clusters of four and five. A slight study of the ground will serve to show the desperate character of the assault made at a time before the Russian artillery had been touched or the morale of the defenders shaken. With the exception of the nullahs, the ground in the immediate vicinity of the forts is bare and smooth, and scarcely a spot exists that is not under fire from some point. Under such conditions it would hardly be expected that an open assault could succeed, and yet the positions reached by the Japanese troops show that the attempt came near being successful, sufficiently so, at least, to justify the Japanese leaders in their undertaking and to relieve them from criticisms for having attempted an impossible feat. Had the Japanese possessed a larger force

l been able to attack on a broader front, it is by no means
tain that an open assault would not have succeeded.

At this period of the siege the Russian garrison numbered
far from 50,000 effectives, whereas the Japanese com-
ants numbered but 60,000, a preponderance too insignifi-
t to warrant any hope of a successful issue in an open
ult. In any event, the attempt to capture a permanently
tified line by open assault had been given a fair trial, and
any troops might hope to succeed it certainly was the
anese. Their failure is no discredit to their prowess, but
s to prove that the engineers' art can not be disregarded
modern warfare, and that fortifications must still be
oned with and that they will play their part in the
re.

he Panlungshan forts were simple earthen redoubts,
ed with field and machine guns, without flank defense,
having casemates and bombproofs. Difficult as was their
ture by open asault, their retention by the Japanese
even more wonderful and speaks volumes for the tenac-
and endurance of their troops. The unshaken Russian
llery poured a concentrated fire into these forts from all
s, while from the Chinese wall and adjoining forts came
ort-range infantry fire. On Ridge H, less than 400
ls away, was a 15-cm. (6-inch) siege battery, whose
y shells landed with telling effect. For a week after
r capture the Japanese are stated to have suffered an
age of 100 casualties daily. By the end of that time
had succeeded in making themselves secure and in
pleting their communications to the rear; so severe was
strain that the firing line in the captured works was re-
d every thirty minutes. On the 24th the Japanese had
ed four machine guns in each of the Panlung forts for
gainst possible counter attacks.

e failure of the assault against Wangtai and Ridge H
fied General Nogi of the impossibility of carrying the
ess by open assault and marks the termination of one
e of the siege. Regular siege methods were now deter-
d upon and approaches opened against East and North
gchikuanshan forts, Fort Kuropatkin, and the Shuishih-
redoubts. Additional siege artillery was also brought
nd mounted and a systematic siege commenced.

PRINCIPAL EVENTS OF THE SIEGE.

Having been an actual eyewitness of but a small part of the siege, I am indebted for many of the following notes to statements made from time to time by various Japanese officers and to other attachés serving with General Nogi's army. Only the main events will be related.

August [illegible], 1904.—The First Division gained a foothold on the extreme eastern knoll of Namakayama Ridge. The captured position was much exposed, but the Japanese troops held their ground.

August [illegible].—Desultory long-range cannonade. The Russian counter attack against the Panlungshan forts the night of the [illegible] is repulsed.

September 7.—The 12-cm. (4.7-inch) naval guns have fired from [illegible] to 2,000 rounds each with little erosion, using smokeless powder.

September [illegible].—On this date the Japanese artillery had been augmented to a total of 362 guns of all patterns, as follows: One hundred and eight field and mountain guns, divisional; 72 field guns, artillery brigade; 2 15-cm. (6-inch) naval guns; 10 12-cm. (4.7-inch) naval guns; 18 12-pounder naval guns; 28 15-cm. (6-inch) and 12-cm. (4.7-inch) field howitzers, horsed; 124 siege guns (12-cm. bronze and 10.5-cm. steel) and mortars (15-cm. bronze and 9-cm. steel).

September 15.—Ninth Division, which lost heavily in the August assault recruited to full strength.

September 19.—The First Division delivered an assault against Namakayama Ridge and 203 Meter Hill. The whole of the former was captured and held. At the latter one company of the First Brigade succeeded in reaching one corner of the ditch, but could not enter, as it was swept by machine-gun fire. After holding its position for two days this company had to fall back as a result of field-artillery fire which the Russians brought to bear from the low ground adjoining Pigeon Bay and which swept the slopes in flank.

September 20.—The First Division assaulted and captured the Shuishihying redoubts, thereby compelling the Russians to evacuate their pumping plant, thus cutting the main water supply to Port Arthur. The assault was made after sapping from an advanced parallel about 100 yards from the est redoubt. The Ninth Division assaulted and captured t Kuropatkin. This assault was made from an advanced allel about 80 yards from the work.

he capture of the Shuishihying redoubts and Fort Kuro- kin now compelled the Russians to fall back behind the way and enabled the Japanese to push forward their s, using the railway embankment as a parallel.

eptember 21–30—Desultory firing by naval guns against Russian ships:—The capture of Namakayama rendered sible a partial view of the Russian fleet which had taken lter under Quail Hill. They claim to have set one ship on on the 28th. Additional saps were opened against G ts, Erhlungshan, Sungshushan, and 203 Meter Hill. The ssians made a number of minor attacks against the Erh- ngshan sap heads.

October 1.—The first 28-cm. (11.2 inches) howitzer com- nced firing, using common shell.

October 4.—No firing this day, owing to high wind.

October 5–10.—Two 28-cm. howitzers opened fire on the ips October 5, the Russians replying vigorously. The night October 7–8 the Russians captured the Japanese saphead front of G fort, but the Japanese recaptured same on the th. The Russians shell the 12-cm. naval battery from olden Hill and Tiger's Tail.

October 12.—The division crossed the railway and captured ne lower advanced trench in front of Sungshushan.

October 16.—Under cover of a terrific bombardment ex- ending from 3 to 4.30 p. m., the Ninth Division assaulted the ower advanced trench in front of Erhlungshan and G fort. For an hour and a half the fire of 36 mountain guns, 6 28-cm. owitzers, 34 12-cm. guns, 4 10.5-cm. Krupp siege guns, 4 12-cm. howitzers, and 2 12-pounders was poured into Fort G, Erhlungshan, and Sungshushan. At G one company of infantry rushed over 100 yards of open space and occupied the parapet with little loss. The lower advanced trench in front of Erhlungshan was also taken with little resistance, the defenders here as well as at G having either been killed or driven out by the terrific bombardment. The aggregate Japanese casualties in this affair were reported to be 150. During the night the Russians made a weak and unsuccessful attempt to dislodge the Japanese from Fort G.

October 17.—Colonel Satow, chief of staff to the commander of the siege artillery, stated that the following additional siege armament has been brought up during the preceding month: Twelve 28-cm. howitzers, 2 15-cm. naval g and 4 15-cm. howitzers.

The total artillery armament on this date before Port Arthur comprised 245 siege and 180 field and mountain g. The 28-cm. were, however, not yet all mounted.

Colonel Satow further stated that it was proposed to use black powder for some of the less exposed siege places to avoid the erosion produced by smokeless powder. No h explosive shells have yet been fired from the 28-cm., but t were stated to be on their way up.

A number of hits were reported from Namakayama as h ing been made on the ships with the 28-cm., as follows: Bayan, 5; Retvizan, 6; Poltava, 4; Peresviet, 17.

October 18–24.—Comparatively little firing during the period. The forts from North Tungchikuanshan to Sungshushan were bombarded in a desultory fashion by the 28-cm. howitzers.

October 25.—The artillery brigade was pushed forward on the front of Kantashan, the right wing to within 1,200 met from Sungshushan and the left wing to within 1,800 meters from Erhlungshan. From these short ranges excellent practice was made against the Russian defense. The guns were sheltered in nullahs and skillfully disposed for concealment.

October 26–31.—This period marks another general assault and attempt to capture the fortress, although the flank defense of the forts had not yet been destroyed. For a week previously the forts had been bombarded more or less by the 28-cm. howitzers, and possibly the Japanese held the view that the Russians would be so shaken by the exceptionally heavy ordnance as to render a successful assault possible.

The front attack extended from East Tungchikuanshan to Sungshushan, inclusive. The First Division was ordered to attack Sungshushan with its left brigade, holding the right brigade in reserve; the Ninth Division was to attack Erhlungshan and Fort P; the Eleventh Division was to attack East and North Tungchikuanshan and O with its right brigade, holding the left brigade in reserve. The infantry a

was to commence at 5 p. m. by an attack of the First and
h Divisions against the upper trench of Sungshushan
the glacis trench of Erhlungshan, respectively. The
lt was to be supported by the artillery brigade and every
able siege piece. Under cover of the bombardment all
were to be pushed forward as fast as possible. Such
the general features of the orders prescribed for the
lt.

11 a. m. on the 26th there was a desultory firing from
aval guns, the Russians hardly replying. At 1 p. m. the
n. howitzers on the Japanese left commenced to shell
heast, East, and North Tungchikuanshan. At 3.30 p. m.
fire from the Japanese right increased considerably,
ungshan being heavily pounded by all the naval guns
the 28-cm. howitzers on the right flank in addition to
al batteries of field howitzers. At 4.30 p. m. the fire on
ungshan was terrific, shrapnel and high explosive shell
ing all over the work. At 5 p. m., to the minute, a col-
of about 200 left the advanced parallel and rushed up in
mass against the glacis trench of Erhlungshan, followed
st immediately by a second column of equal strength a
farther to the right. Both columns reached the trench
trifling loss and at once entered it. Two or three Jap-
shell fell among them, notwithstanding that two flags
vigorously waved. Three more columns of about 200
left the parallel in the next twenty minutes and estab-
d themselves under cover below the outer crest of the
s. At 5.20 p. m. the Russians fired a large mine at the
ern angle of the trench, resulting in a tremendous explo-
Meanwhile three approaches were being constructed
the trench to the parallel. The Japanese made exten-
use of their wooden bomb guns to fire grenades.

e upper trench in front of Sungshushan was rushed a
minutes before that of Erhlungshan by the First Di-
n. At nightfall fighting was still going on. During
night the Russians made no less than four counter-
ks against the upper trench at Sungshushan, all of
h were repulsed. The Japanese report their losses
e capture of the Sungshushan trench at 140 and at
ungshan at 300, most of the latter being caused after

the occupation of the trench by Russian indirect fire. The Japanese profited by the bombardment of the 26th to seize the whole of Fort G and to fully occupy the same.

On the 27th and 28th the Japanese bombarded intermittently with their naval guns and 28-cm. howitzers.

On the 29th of October the Russians counter-attacked the Sungshushan upper trench at 6 a. m., and at 9 a. m. drove the defenders back to where they were on the 28th, but between 1 and 2 p. m. the Japanese recaptured the trench.

On the 30th a heavy bombardment commenced from the siege artillery at 11 a. m. against Sungshushan, Erhlungshan, O, East and North Tungchikuanshan, and the works in rear. The practice was excellent. At 12.30 p. m. the field artillery commenced shrapnel fire, the Russians replying feebly. At 1 p. m. a simultaneous infantry assault was commenced on all points of attack. At Sungshushan three columns of 200, 200, and 100 successively charged from the upper trench through narrow openings in the wire entanglements. These columns left some 80 bodies on the ground. The columns were seen to descend into the ditch, carrying scaling ladders with them. At 3.30 p. m. what appeared to be a large mine exploded at the salient angle of Sungshushan, and at 4 p. m. an enormous explosion occurred apparently in the interior of the fort. Meanwhile a sharp musketry fire was going on between the Japanese in the upper trench and the Russians in Erhlungshan and Sungshushan. Nothing more could be seen of the columns which had entered the ditch. Occasionally a man attempted to return, but nearly all of these were shot down. A few men tried to mount the parapet, but all these were killed.

Erhlungshan was not attacked from direct front, but a small party assaulted the western face, and it is certain that some entered the ditch.

At 1.15 p. m. East and North Tungchikuanshan, Kobuyama, O, and P were simultaneously assaulted. The Japanese succeeded in establishing themselves close to Kobuyama and P, but were everywhere else repulsed. The Russian shrapnel and machine-gun fire were murderously effective.

'ticularly deadly was the shrapnel fire from Southeast ıgchikuanshan, which flanked the slopes of East Tung- ɩuanshan.

›n the 31st the Russians counter attacked twice from P drove back the Japanese to their advanced parallel. On ring this the brigade commander brought up reenforce- ıts and not only recovered the Japanese position, but cap- ·d the whole of P, which was thereafter abandoned by Russians. In honor of this gallant feat the work was ımed Fort Ichinohe, after the brigade commander. An- ›r feeble assault was made on the 31st by a small column er cover of 28-cm. howitzers and shrapnel fire against 'th Tungchikuanshan, but without success.

'he net results of the October assaults were the capture ? and G, the glacis trench of Erhlungshan, and the upper ıch of Sungshushan. The possession of the last two ıches materially shortened the labor of sapping. It seems e doubtful whether the Japanese leaders really expected decisive results from these assaults, for they were made ı small columns and rather half-heartedly. They appear ave been undertaken more with a view to testing the tem- of the defenders and gaining ground, and with this view he case the assaults were justified. The Japanese report r losses in the series of assaults at 2,021 all told.

'ovember 1.—Mining operations were commenced against th Tungchikuanshan, Erhlungshan, and Sungshushan.

'ovember 2.—Two enormous explosions occurred inside old town of Port Arthur, caused by the blowing up of e magazines by the Japanese artillery fire.

'ovember 4.—On this date the situation was about as fol- ;: Saps were being pushed against 203 Meter Hill from southwest; a trench was being opened between G and lungshan as a preparation for assaulting the Chinese l in front; saps were being pushed from East and West lungshan against the Chinese wall opposite; the mine ɩts and galleries against North Tungchikuanshan, Erh- ɀshan and Sungshushan were making steady progress; on extreme right wing the Japanese drove back the Russian ›osts to Pigeon Bay. The Japanese also advanced some heir siege and field artillery, two 9-cm. mortars being

placed west of Shuishihying to fire on the road in rear Erhlungshan, while eight batteries of the artillery brigade and six 12-pounder naval guns were placed in line astride Shuishihying.

November 5–9.—Desultory firing by the siege artillery and steady mining and sapping. The fire of the Russian artillery has noticeably slackened and the quality of their ammunition deteriorated, most of their heavy shells failing to explode.

November 10.—A further advance of Japanese siege artillery, eight 12-cm. howitzers being pushed forward between Shuishihying and Palichuang and four 12-cm. naval guns being advanced to a position west of the field artillery observatory. The Russian war ships were regularly shelled by the 28-cm. howitzers and the Russian artillery in Sungshushan had been silenced. In the Eleventh Division the miners had broken into the counterscarp gallery at the salient and a struggle was in progress to dislodge the Russians from the gallery on the east flank of the fort.

November 13.—Three companies of engineer troops, one from Guards Division, one from Sixth Division, and one from Eighth Division, arrived from the north and were assigned one to each of the divisions of the besieging army. This was rendered necessary owing to the heavy losses in the engineer companies during sapping and mining.

November 14–16.—Sapping and mining continued. The Russians indulged in frequent counter attacks at night with small detachments without serious consequence to the Japanese. Most of the First Cavalry Regiment and three batteries of the Seventeenth Regiment of the artillery brigade departed for the north.

November 17.—Some mines exploded at Sungshushan, breaking in the counterscarp gallery.

November 18.—The First Brigade of First Division (First and Fifteenth regiments) is holding Namakayama and sapping against 203 Meter Hill. Russians attack sapheads nightly, but not in strength.

November 19.—The Russians made a determined counter attack at Erhlungshan, but were repulsed. Part of the Seventh Division arriving by route march. This division landed at Dalny on the 18th. There is no cavalry regiment ıe division, but each company has six mounted men d. The divisional artillery consists of two batteries and two of mountain guns.

nber 20.—Three mines fired at Erhlungshan, blowing erscarp and partially filling the ditch. The counter-ıllery at the northeast angle of the ditch had been ly blown in by mines sunk in the glacis. The en-ılso found and cut the lead wires to some Russian anted in the ditch, making the ditch safe. In ad-the three engineer companies from the north the Twelfth Kobi companies of sappers have joined the forces.

strating the heavy casualties suffered by the Japa-ıy be instanced on the authority of an adjutant of Division that at this date only 1 battalion com-ıt of 12 in the division remained unwounded. The tal commanders, as well as the lieutenant-colonel ng the engineer battalion, were all killed or In one infantry company there were but 2 ıo had survived the campaign. The chief of staff d Army also stated that at this date the engineer f the First Division had but 60 men of the origi-

ı. the Russians opened a heavy rifle and artillery lasted about one hour. This was caused by a ıoitering party at Erhlungshan which drew the defenders and led the Russians to believe an impending.

21–25.—Sapping and mining continued with ombardment by the siege artillery.

26–December 5.—This period marks the third lt of the fortress. By sapping and mining the y forts on the front of attack, North Tung-Erhlungshan and Sungshushan, had had rowned and flank defenses destroyed and the lers thought the time opportune to carry the orm, although the parapets of these forts had reached.

e assault was inaugurated by a heavy artillery forts to be attacked. At 12.50 p. m. a mine n the ditch of North Tungchikuanshan under the northwest angle of the parapet, and this was the sig for the infantry assault which was made simultane- from the advanced parallels. At Sungshushan and Erh- shan the storming parties reached the works without heavy loss. At the former work the Japanese were dri- at 1.30 p. m. running back in considerable panic, w heavily pushed while doing so. At Erhlungshan the stor- ing party remained in the work. By 2 p. m. artillery had almost ceased, but began again at 4 p. m., when a str Japanese column entered Erhlungshan. The Japanese captured part of the Chinese wall between G and H Panlungshan. North Tungchikuanshan was attack- one battalion, the leading column consisting of one com- pany. This attack suffered heavily from the flanking f coming from Southeast Tungchikuanshan and also fr Russian hand grenades. At Q the Japanese lost heavily, reached the crest of the parapet and some men cli- over and engaged the Russians in grenade throwing a bayonet fighting. Of those who entered none return- At North Tungchikuanshan a few men reached the parap- but the majority took cover in the mine crater. A sma party climbed up from the western side, but were stopp by the wire entanglement and had to retire with some lo During the assault Antzushan and Itzushan were heav- shelled by the naval guns.

All the Japanese assaults were unsuccessful, they bei unable to hold their ground in the face of the concentrat Russian fire coming from the interior works, the supporting works, and the retrenching lines and gorges of the fo attacked.

During the night of November 26–27 the Japanese launched a forlorn hope against the Sungshushan annexed batter- and trenches, seeking to turn the Russian lines of defen- This assault was made by a volunteer force from all four div- sions, and is best told by a surviving officer of the Firs Division, whose name is withheld, as follows:

> The force was regarded as a "Keshitai" (forlorn hope), and wa composed of detachments from all the four divisions at Port Arthu the number being approximately as follows:
>
> First Division, 800 men; two battalions of 400 each from each br gade (each regiment furnished two companies of 100 men each); Nin

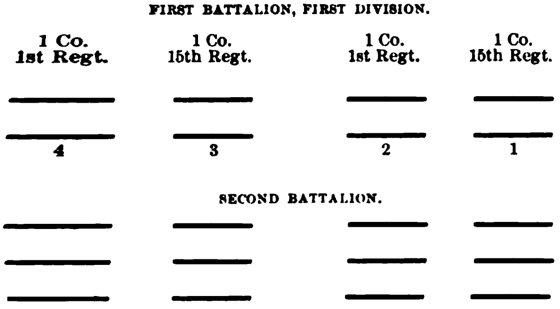
, 400 men; Seventh Division, 1,200 men, all from one regi-
:leventh Division, 200 men.

evening of the 25th all the officers of the various detachments
d at Shuishihying and received General Nakamura's (com-
First Brigade and leader of the forlorn hope) instructions.
'e to assemble in rear of the high ground at M (Pl. XI) by
ı the 26th, and were to remain there all day during the gen-
:k of the 26th. Plenty of cover existed in ravines, old
etc. If the general attack should prove successful, the de-
would rejoin their respective commands. If, on the other
roved a failure, the forlorn hope would march after night-
26th, assault the auxiliary work at G, and after its capture
the second Russian line at B B.

e was assembled as ordered at 5 a. m. on the 26th. Be-
d 6.30 p. m. it moved off in column of fours. It was nec-
e in position for the attack on G by 9 p. m., as the moon
about that time. The distance from M to G by the route
s over 1½ miles.

well until a small bridge was crossed at N. Here a
southwest to F. Owing to the darkness the column had
considerably, and when the rear detachment, composed
the Seventh Division who were ignorant of the country,
is bridge it left the proper road and followed this track
Here the commander perceived that he had mistaken
started across country to rejoin the main body, which
did. Some 80 men, who had evidently straggled in
, followed the track until they collided with 400 Rus-
d in F. Most of these 80 men were either killed or
ew succeeded in hiding until the night of the 27th–28th,
nd their way home.

›w to the main body, on reaching a spot marked X on
halt was made and the column closed up. The power-
s on C, D, and E now swept the valley, and the pres-
anese force was discovered, resulting in a tremendous
re from C, D, E, F, G, and H. This fire, though ex-
caused very few casualties. The Japanese did not
sian fire, but pushed on to close beneath G, where they
llows:



NINTH AND ELEVENTH DIVISIONS.

SEVENTH DIVISION.

The colonel of the First Division Regiment of two Battalions h been wounded at X, the command of this regiment devolved upo commander of the First Battalion and the narrator assumed comm of the First Battalion. No. 4 Company of the First Battalion attac the enemy at G and succeeded in penetrating the lines. The Russ thereupon fired three mines, which caused heavy losses and compell the Japanese to retire. Meanwhile large Russian reenforcements a rived and every subsequent assault was repulsed, while a terrific fi was poured in from front, rear, and both flanks by the aid of t searchlights.

The Japanese eventually retired between 2 and 3 a. m. and succe in reaching their lines with a loss of some 1,200 killed and wound Among the wounded was General Nakamura, the leader of the assa ing force. They suffered very little during retirement. The tw companies of the First Battalion lost about 50 per cent of th strength, nearly one-half of the losses being in dead. The Russ hand grenades caused many casualties.

The narrator assigns four principal reasons for the failu of the enterprise:

1. The time (a few hours after a general assault) was inju diciously selected, as the Russians would be likely to be mor alert than usual.

2. Too much noise and hurrahing in the Japanese ranks.

3. Undue opening out of units.

4. The employment of a mixed force from different di sions instead of a complete and distinct unit.

The criticisms made by the narrator, especially the on regarding the time selected for attack, are undoubtedl well taken.

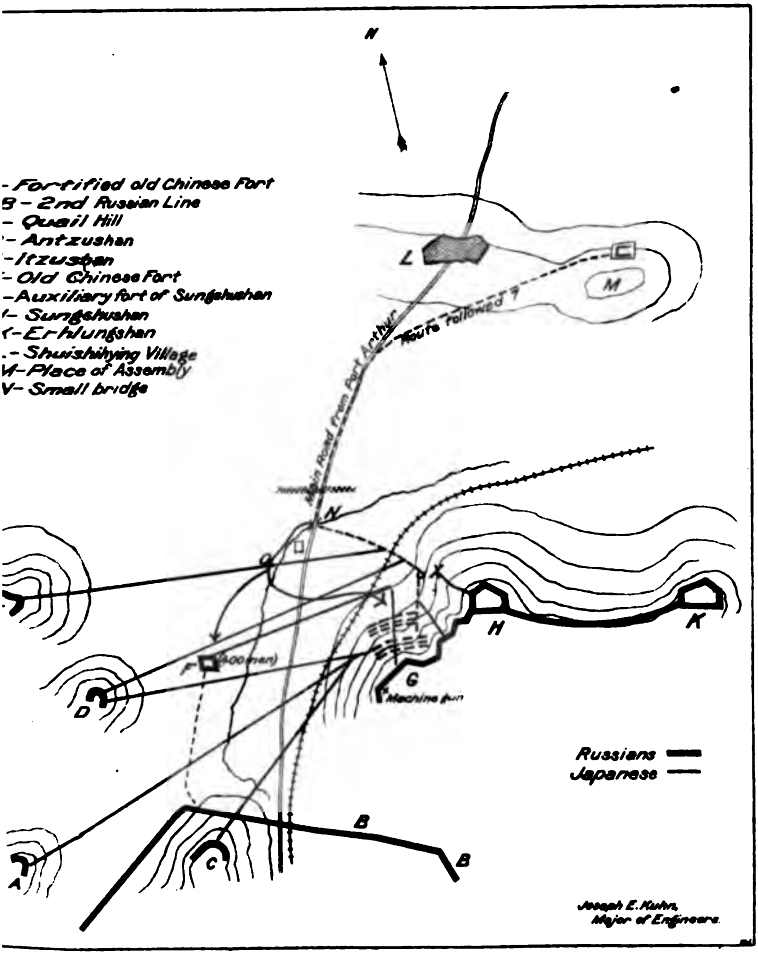

N
-Fortified old Chinese Fort
B - 2nd Russian Line
- Quail Hill
- Antzushan
-Itzushan
- Old Chinese Fort
-Auxiliary fort of Sungshushan
- Sungshushan
-Erhlungshan
.- Shuishihying Village
-Place of Assembly
- Small bridge
L
M
Route followed ?
Main Road from Port Arthur
N
O
X
H
K
F (400 men)
G
Machine gun
D
A
C
B
B
Russians
Japanese
Joseph E. Kuhn,
Major of Engineers.

PLATE XI

om the fact that the column lost its way it would appear
10 staff arrangement had been made to prevent mistakes
the road.

irt from all criticisms, however, the night attack on the
hushan annexed batteries and trenches deserves a place
st the most desperate undertakings chronicled in
y history. The slopes leading to the position are
mooth, and absolutely devoid of all cover and swept by
lank, and reverse fire. The Japanese dead, to the num-
300 to 400, could be plainly seen on the slopes from its
ht up to the trenches, and here they lay until after the
ition of the fortress. No doubt many wounded, who
ave been saved, succumbed where they had fallen, as
ance was possible.

apanses now abandoned for the time being their at-
inst the forts in the eastern sector of defense, and
their energies to the capture of 203 Meter Hill,
ey commenced attacking on the 28th at 8.30 a. m.
alions were sent against height 210, and one battal-
ist the height 203. At the same time three com-
the Thirty-sixth Kobi regiment fiercely assailed
ama.

0 a. m. the Japanese were holding onto the top
HH (Pl. XII), while the lower trenches, FF, were
ir reserves. About 11.30 a. m., the majority of the
e to the heights 210 and 203 broke and fled down
n a compact mass pursued by shrapnel with which
is flanked the slopes from the low ground adjoin-
Bay. The troops, however, rallied at the lower
d returned to their former positions. At Akasa-
Japanese attack was entirely unsuccessful and
heavy. They, however, succeeded in construct-
-bag revetment, C, within 50 yards from the
iches. At 7 p. m. the Russians made vigorous
cks and drove all the Japanese back to their
es.

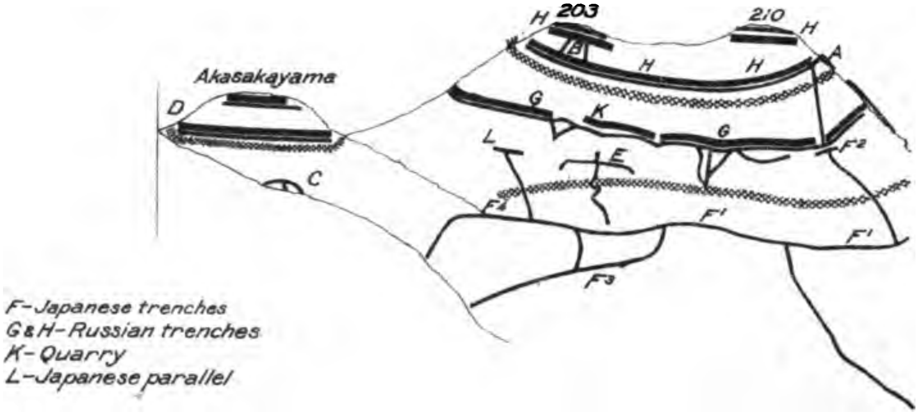
night of November 29-30 the Japanese again
ghts 210 and 203 and also the Russian trenches
ima, but were unable to hold them. The fight-
d to have been hand to hand and the losses se-
sides.

[illegible]

[illegible] appears to have been partially evacuated [illegible] which [illegible] Night came on without any change [illegible] The Russian artillery took no part in [illegible] but the rifle and machine-gun fire was [illegible]

During the night of November 30–December 1 the Ja[illegible] again occupied the Russian trenches at Akasakaya[illegible] were again driven out. An approach was also made [illegible] the southwest corner of 203 (A in sketch) and the he[illegible] covered by a strong breastwork of sand bags. Two ap[illegible] proaches were also made up the left side toward 203 (B [illegible] sketch). It is evident that the Russians must have evac[illegible]

Dec.1.
C-Japanese sandbag enclosure
D-Russian trenches
E-Japanese advanced parallel from
which attacked Dec.5.



F-Japanese trenches
G & H-Russian trenches
K-Quarry
L-Japanese parallel

Joseph E. Kuhn,
Major of Engineers.

PLATE XII

ʾ lower trench, H, at this time, but were still holding
ıe two summits.

nber 2-4.—The situation remained unchanged. A
armistice was agreed to on the 2d between 10 a. m.
m. in front of the Eleventh Division to permit of the
f the dead.

ber 5.—The Japanese renewed their assault and by
were in possession of height 210, which was attacked
sand-bag breastwork at A. The first attack on the
)3 was driven back and a portion of trench H, im-
' below the height, reoccupied by a small party of
Meanwhile the Japanese artillery kept playing
203 and the ridge between 203 and 210, but more
ly on the reverse slopes of the position. At Akasa-
ıe Russians continued to hold their ground. The
ıad constructed an excellent advanced parallel, E,
roops to assemble for attack. By 1.30 p. m. this
d the approaches leading to it were filled with in-
h fixed bayonet. At 1.45 p. m. one company
ɘr by two and threes, re-formed under cover at
the hill and lay down at G trench.

ninutes this company advanced in extended order
its way up to height 203, seemingly with little
ɘw Russians in H trench had withdrawn before
. Reenforcements from E were constantly sent
ıpany by company, each re-formed under cover
'anced to the summit. By 2.30 p. m. the whole
n height 203 to 210 was occupied by one bat-
nen could be seen throwing stones and grenades
ns on the other side of the hill. During all
reverse slopes of the hill were continuously
ire of 36 field guns, 18 firing shrapnel at 3,300
high explosive shell at 6,000 yards. Owing to
ve fire of these guns, the Russians were unable
enforcements, though they twice attempted to
0 p. m. firing had practically ceased and the
itterly contested hill remained in the posses-
panese. With the capture of the 203 Meter
ayama became untenable, as well as the whole
and both were abandoned by the Russians.

An eyewitness to the two assaults of November 30 and December 5 draws a sharp contrast between the dense and unwieldy formation adopted in the first attack and the skilful method employed in the final assault. That the Japanese suffered needless losses from their formation on the 28th of November seems unquestionable.

The 203-Meter Hill position was important to the Japanese for the reason that from it an unobstructed view of the harbor and new town was possible. The crest line of the position is only 225 yards long, and it seems almost incomprehensible that the position should for so long have resisted the persistent and desperate assaults of the Japanese. Its strength lay in its steep slopes and in the covered trenches constructed by the Russians. The trenches were bombproof against field artillery, having a heavily framed roof of plate iron and timber balk covered with 3 to 4 feet of earth. Machine guns and rifles were fired through ports and loopholes, so that the defenders were practically unassailable. It was not until after the blinded construction of the trenches had been severely battered by the 28-cm. howitzers and heavy siege artillery that an infantry assault stood any chance of success. The commanding position of the defense also enabled grenades to be used most effectively, and they were employed with deadly results. Under the cover of the hill the Russians were able to bring up reenforcements to the firing line without loss, and this fact was mainly responsible for the failure of the earlier assaults. The effective fire of the Japanese artillery on the reverse slopes during the final assault prevented reenforcements from arriving and proved a large factor in the final success. The total Japanese losses in the series of assaults from November 26 to December 5 are admitted by the headquarters staff to have been 15,000, of which more than half occurred at 203-Meter Hill. General Oseko, commanding the Seventh Division, told me personally that his division had lost 6,000 men in the assaults, a fearful baptism of fire for troops who had landed only several weeks before. The numerous graves and monuments to the dead in the vicinity bear mute testimony to the fierceness of the struggle.

December 6.—The Japanese brought up two 12-cm. (4.7

aval guns in the neck between Akasakayama and
er Hill, with which they commenced bombarding the
n and ships.

ber 7-18.—The work of mining the parapets of
ungchikuanshan, Erhlungshan, and Sungshushan
d steadily. From the observatory on 203-Meter
fire of the 28-cm. howitzers was directed with good
ainst the ships, many hits being obtained. These
observed to settle on the bottom, one after the other,
the *Sevastopol*, which steamed out of the harbor
shelter under the highest ridge of Tiger's Tail
This placed her out of the range of the 28-cm.
but the two 12-cm. naval guns at 203-Meter Hill
indirectly and secured a number of hits, the fire
olled from an observation station on the coast on
left of the Eleventh Division.

two 12-cm. naval guns mounted at 203-Meter Hill
nocked out by the fire of the Russian guns in the
tor of forts, chiefly the Taiyangkou forts, whose
ad suffered little damage from the bombardment
ne. They were, however, replaced by two others
hind sand-bag parapets 30 feet thick, firing
ow embrasures so directed as to make the guns
fire of the forts. The Japanese also commenced
ounting two 28-cm. howitzers in the valley im-
ind 203-Meter Hill.

8.—The parapet of North Tungchikuanshan
and the work assaulted at 10 a. m. After a
tracted and uncertain struggle the work was
at 11.30 p. m. It cost the Japanese about 400
was the first permanent work to fall into their
me time the energy of the defense had been
kening, and it was beginning to be apparent
as not far distant. Through some deserters
that General Kondratchenko, his chief engi-
Rashevski, and staff had been killed on
a 28-cm. shell which had landed in the un-
te of North Tungchikuanshan, where the
staff had gathered to discuss ways and means
death of this officer proved a serious blow to

[illegible] and had been largely [illegible]

December [illegible].—Mining and [illegible]

December [illegible].—The parapet of [illegible] The [illegible] was tremendous and completely hid the fort fr[illegible] for a few moments. When the smoke had cleared off the exterior slope at the salient of the fort was seen filled with a dense crowd of Japanese infantry, who hugged the ground. Simultaneously with the ex[illegible] every available piece of Japanese artillery broke for[illegible] fierce bombardment. The fire of the [illegible]-cm. howitze[illegible] heavy siege guns was directed mainly against the inter[illegible] supporting works, while the field artillery shelled Er[illegible] shan and Sungshushan. The air was so full of b[illegible] shrapnel, high-explosive shells, and the dust created by [illegible] that at times the fort was almost lost to sight. The R[illegible] artillery did not reply for a few moments, but gradu[illegible] volume of fire increased, and soon its shrapnel was sear[illegible] the approaches and parallels in front of Erhlungshan, [illegible] its howitzers and heavy artillery fired at the most expo[illegible] the Japanese siege batteries. Sheltered more or less i[illegible] mine crater, the Japanese troops clung to their posi[illegible] making, apparently, no attempt to enter the fort itself. [illegible] appears that the Russians had occupied the heavy gun [illegible] which lies in the interior of the fort and with machine g[illegible] raked the front parapet and thus made it impossible for [illegible] Japanese infantry to leave their cover on the exterior sl[illegible] Meanwhile, the Japanese brought up three machine guns [illegible] with these replied to the Russian fire from the heavy [illegible] line. Several mountain guns had also been brought up [illegible] the advanced parallels and saps and did good executio[illegible] keeping down the fire from Sungshushan. These mount[illegible] guns were set up in casemates made of sand bags, with ov[illegible] head cover of steel rails, timber, and earth.

The bombardment kept up without diminution until ab[illegible] 1 p. m., when it slackened perceptibly on both sides. Th[illegible] Japanese bomb guns could be seen at work in the advan[illegible]

from where they threw grenades into the interior of
This condition of affairs remained unchanged until
5 p. m., when the Japanese infantry could be seen
long the flanks of the work on the outside of the
By this movement they eventually turned the Rus-
nd the heavy gun line and secured possession of
part of the work. The Russians retired to the
pet, which had been arranged for fire to the front,
ained themselves for several hours longer. By
the Japanese had fully mastered the position and
and strongest of the permanent works on the
tack fell into their possession. The attack was
e Eighteenth Brigade, Ninth Division, two bat-
from each regiment, being in front line. A
r of field and machine guns were included in the
hlungshan. The assault entailed a loss of about
the Japanese.

29–30.—The Russian outposts in the vicinity of
pressed back by a steady advance of the right
Seventh Division. Large conflagration observed
f Port Arthur the night of December 28–29.

31.—At 10 a. m. to the minute the Japanese
nes under the parapet of Sungshushan. A tre-
d of smoke and dust temporarily obscured the
plosion was the signal for the general bom-
ch followed instantly, nearly all the Japa-
ng simultaneously, so that the first discharge
ed a volley. The fire of the guns was most
h battery having its designated target, the
ntrolled by the chief of the siege artillery
vatory on Artillery Hill. When the smoke
n had cleared away sufficiently a large-sized
th Japanese infantry could be seen at the
fort. Individuals and parties of two and
seen disappearing over the tip of the crater
of the work. Seven minutes after the first
nd one occurred in the interior of the fort.
cleared away the Japanese infantry were
the crater and sending men over. The
did not open for thirty minutes after the
hen the guns in Antzushan, Itzushan, and

the mortars on Golden Hill commenced firing. The Japanese field guns vigorously shelled the Sungshushan annex batteries, and their shrapnel raked the parapets continuously. The Japanese artillery fired in full force until about 11 p. m., at which time a small white flag was hoisted in the interior of the fort.

Subsequent developments showed that what happened was as follows: When the Japanese fired their mine the gallery which runs from the gorge to the counterscarp gallery at the salient was demolished. The flame and gas of the explosion rushed along this communicating gallery and reached the Russian magazine, which connects with it, carrying fire into the latter and causing the second explosion. This buried about half of the defenders and cut off their retreat from the parade to the gorge. Overwhelmed by the explosion and escape cut off, the survivors of the garrison had hoisted the white flag and surrendered. The whole affair was over in an hour and cost the Japanese only 133 casualties. The entire Russian garrison of 300 was either killed or captured, 3 officers and 156 men being taken prisoners. The Russian artillery kept on firing, but rather feebly, until about 2.45 p. m., using mortars and howitzers from Golden Hill and from west of Catherine Hill. The heavy shells from these guns landed on the slopes in front of Erhlungshan and Sungshushan, creating spectacular explosions but doing no damage. After the capture of the fort the Japanese slackened their artillery fire gradually, and practically ceased firing by 3 p. m. With the fall of Sungshushan the entire line of detached forts from this point to North Tungchikuanshan had fallen into the possession of the Japanese. Three field pieces and two machine guns were among the trophies taken in Sungshushan. A noteworthy feature of the assaults on Erhlungshan and Sungshushan was the fact that they were not heralded by a preliminary bombardment, as was the case in the earlier assaults. On the latter occasions the firing of the mines was the signal for both assault and bombardment, and the Russians had no time to adopt special defensive measures.

January 1, 1905.—More or less firing heard during the early morning hours, continuing until noon. Although no d been scheduled for this day, the prolonged firing n of the attachés to investigate from the nearest t, when it was discovered that the Japanese had the Chinese wall and were assaulting the inner Pushing on into the valley it soon became appa-ridges Ro and H were already occupied by the who could be seen behind the sand-bag parapets e Russians, who had fallen back to their inner attack on the Wangtai fort was in progress at it which time its northern slopes were filled with fantry, while the Japanese artillery was vigor-ng the summit. The entire Chinese wall from n to North Tungchikuanshan was also in pos-e Japanese.

that a reconnoissance made at the instance of inohe, commanding the Sixth Brigade, Ninth eloped that the Chinese wall was lightly held. immediately from the Panlungshan forts and all in his front as well as ridges Ro and H, lly occupied by 7.30 a. m.

about one battalion of Japanese troops were lower half of the slopes of Wangtai on the hile a detachment of 50 was about three-way up the slope on the northeast side. The regularly grouped over the face of the hill for cover. The Russian artillery was almost few guns to the east of Wangtai answering rtillery, which was vigorously shelling the ill over the head of the infantry. Excellent ade, and so far as could be observed the suffered no casualties from their own artil-gh the foremost of them lay only about 100 mmit.

Japanese artillery ceased firing on Wangtai ttention to the neighboring works, chiefly The infantry, which had meanwhile been out two companies from the Chinese wall, vance up the slope, not in any regular for-oups of about one-half zug each. The lead-northeast slope soon crossed the Russian summit, showing that the latter must have [illegible] Presently the Ja flag was waved from the summit to indicate that the po had been taken. For some time after there was [illegible] artillery fire, the Russians shelling Wangtai and the Ja were firing against the Russian batteries. During the [illegible] on Wangtai the Japanese machine guns on Ridge H [illegible] heavily against the Russian interior lines.

The capture of Wangtai was made conjointly by of the Ninth and Eleventh Divisions, and the Japan fered little loss both here and in the capture of the C wall and Ridge H and R, their aggregate casualties about 300. Wangtai is an important point, as from good view is had of the old town and east harbor.

On the evening of the 1st a parlementaire bearing a flag was seen to approach Shuishihying and to deliver a to the Japanese. This letter was from General Stoessel proposed a discussion of terms for surrender.

January 2.—During the night of January 1-2 rep heavy explosions were heard in the direction of the fort and occasionally the rapid file fire of infantry. The R sians were mining their ships and blowing up East Tung kuanshan. Under cover of the darkness and profiting their successes of the previous day, the Eleventh Division cupied batteries R, M, N, O fort, and East Tungchikuan the latter having been first blown up by the Russians evacuation. At 10 a. m. a truce was declared for the purp

ssing terms of capitulation, and thereafter firing
he first time in five months. By nightfall it was
hat terms had been agreed upon, the news of which
hed the attachés through the joyful and noisy ban-
he victorious Japanese soldiers, whose usual reti-
l imperturbability gave way to demonstration over
l-earned victory, purchased at such fearful sacri-

TERMS OF CAPITULATION.

. The military and naval forces of Russia in the fortress
f Port Arthur, as well as the volunteers and the officials,
me prisoners.
he forts and fortifications of Port Arthur, the war ships
aft, including torpedo craft, the arms, ammunition, the
d every material for warlike use, shall be handed over
the Japanese army.
hen the above two articles are agreed to, the following
taken by way of guaranty, namely, by noon on the 3d
risons shall be withdrawn from all fortifications at
antzushan, Taantzushan, and all the highlands on the
se, and the said fortifications and forts shall be handed
anese army.
uld it be recognized that the Russian military or naval
or take any other steps to alter the condition of the
ted in Article II, and actually existing at the time of
signature, these negotiations shall be broken off and
my shall be free to adopt measures at its discretion.
fficers of the Russian military and naval forces shall
d to the Japanese army maps showing the arrange-
fenses, the position of mines and torpedoes or other
s, as well as lists of the organization of the naval
es in Port Arthur, nominal rolls of the military and
ir ranks or grades, similar rolls relating to the war
ps of all descriptions and their crews, and tables of
s, male and female, their nationalities and their

ms (including those in the hands of the forces), the
ll material for war uses, except private property,
n their present positions. Rules relating to the
receipt of those objects shall be arranged by com-
Russian and the Japanese armies.
panese army, as an honor to the brave defense
n army, will allow the officers of the Russian mili-
es and the officials attached to the said forces to
, together with all privately owned articles di-

rectly necessary for their daily existence. Further, with re the said officers, officials, and volunteers, such of them as pledge themselves in writing not to bear arms again until of the present war and not to perform any act of whatever detrimental to the interest of Japan, shall be permitted to their country, and one soldier shall be allowed to accompany officer of the army and navy. These soldiers shall be required a similar pledge.

ART. VIII. The disarmed noncommissioned officers and army and navy, as well as the volunteers, wearing their carrying their tents and all privately owned necessaries of shall, under the command of their respective officers, places indicated by the Japanese army. The details of this ment will be shown by the commissioners of the Japanese

ART. IX. The officials of the sanitary and paymaster's of the Russian military and naval forces in Port Arthur shall and continue to discharge their duties under the control Japanese sanitary and paymaster's departments so long Japanese army deems it necessary for ministering and sustenance to the sick, the wounded, and the prisoners.

ART. X. Detailed regulations with reference to the manage the noncombatants, the administration of the town, the perfor of financial duties, the transfer of documents relating to matters, and with reference to the carrying out of the agreem other respects shall be entered in an appendix to this agree Such appendix shall have the force of the agreement itself.

ART. XI. Each of the contracting parties shall receive one this agreement, and it shall become operative from the time signature.

EVENTS SUBSEQUENT TO CAPITUATION.

Immediately after the capitulation the works on the fr of attack from East Tungchikuanshan to Sungshushan w thrown open for inspection, but permission to enter the t was withheld until the formal entry, which was plann take place January 13, the only persons allowed to enter town in the meantime being the medical corps of the J nese and the various commissioners appointed for the p pose of inventorying and taking over prisoners and prop Several Japanese field hospitals were met on the 3d en r to Port Arthur to render assistance to the Russian sick wounded, of whom there were 16,000 in hospital.

The Japanese at once commenced the work of disma their siege batteries and removing the surplus ammunit By the end of a week all the siege artillery save the howitzers had been parked in the vicinity of army h

s and the artillery depot in close proximity to the
l.

vork of clearing the field and of burying the dead
commenced at once, and for a week after the capit-
funeral fires could be seen burning at a number of
Many of the Japanese dead had lain since the
ıssaults where they had fallen on the slopes of the
han forts and inside the Chinese wall on the slopes
tai and Ridge H. The weather was unseasonably
l the stench at times fearful. Many dead Japanese
ans also lay scattered about on the glacis of North
ıanshan, Erhlungshan, and Sungshushan, while
s of these works were filled with mangled frag-
human remains, showing the fearful effects of
nd high-explosive shells. At a number of points
aps of Erhlungshan and Sungshushan dead Rus-
found buried in the parapets.

th of January the work of mustering the Rus-
rs had been completed, and the first detachment
0 marched from their rendezvous at a village in
Seventh Division to the Changling railroad
e they entrained for Japan. Their route took
sochiatien, where the attachés were quartered,
an opportunity for observing them. Much was
ten regarding the straits to which the garrison
ıced at the time of capitulation. Certainly the
f those who marched out as prisoners belied
for both men and officers looked to be in good
h as regards their physical appearance and
officers looked especially dapper and well fed
traces of privation or suffering. The evacu-
isoners was effected with great dispatch, the
marching out on the 11th.

ɔrity of the headquarters staff of the Third
er of Russian prisoners sent to Japan num-
rs and 23,491 rank and file. Besides these
officers who accepted parole, and these were
with them 229 men in the capacity of serv-
es, making the total number of those who
040, of whom some 4,000 were officers and
Russian fleet.

The following Russian officers of high rank refused par
Lieutenant-General Smirnov, chief of fortifications: Lie
tenant-General Fock, commanding Fourth Division: Maj
General Nikishin, Major-General Beli, Major-General
shattonski, Major-General Ilmann.

The following higher officers accepted parole: Gen
Stoessel, governor of Port Arthur; Major-General R
chief of staff; Major-General Nadane; Major-General K
tenko; Admiral Ukhtomski; Admiral Gregorovich; Adm
Rostenski; Chief Engineer Ryndenbeck, ranking as ad

The number of prisoners who marched out was a ma
of considerable surprise to everyone, no less to the Japa
who had several times reported the number of effectiv
the end of the siege to be not more than 7,000. In conver
tion with General Idichi, General Nogi's chief of staff,
January 3, he stated, in reply to my question, that the nu
ber of Russian effectives at the time of surrender was un
5,000. Some time in February, when General Idichi w
serving as governor of Port Arthur, I took occasion
bring this matter to his attention and was informed t
the number of prisoners mustered proved a surprise. H
statement of January 3 was based on the statement made
him by General Reiss while discussing the capitulation a
Shuishihying. As a matter of fact, there is evidence
show that the Russian leaders had lost all control of
direction of affairs and were themselves ignorant of
strength of their own forces. Questioned as to this su
ject, a highly intelligent manager of a large business ho
in Port Arthur informed me later that the military auth
ities had for some weeks prior to the capitulation given
the information that their force of effectives did not ex
7,000 or 8,000. It seems incomprehensible that the R
sians were ignorant of their own numbers or that their m
tary organization had so deteriorated that no returns of
troops were rendered. Either this must have been the c
or else the Russian leaders were seeking to justify th
capitulation. It was quite easy to understand how, with
stated returns, it would be possible to lose track of t
strength of the defenders, who were scattered along a
fensive front of some 16 miles, living in dugouts and bo
proofs in the hills.

ie 13th of January General Nogi made his formal ito the captured city. This took the form of a nd well merits a brief reference. The troops designmarch in the review assembled along the highway t Arthur between Shuishihying and Quail Hill, latter the head of the column rested. Each regiinfantry furnished a company of 200 and each section of cavalry, a battery of artillery, sections engineers, train, and sanitary detachments. At the column moved off headed by the only band in and followed by General Nogi and staff, to which ;s were attached for the occasion. The route of along the north slope of Quail Hill, through the long the harbor front, into the new town, where gi and staff halted in front of a park while the ed in review, first those of the First Division, venth, then the Ninth and Eleventh, followed by 3rigade and the two Kobi brigades. The troops brown winter overcoats, which proved rather eavy for the mild and sunny days. In the old ious Chinese dignitaries and officials were drawn owing and waving Japanese flags as the column The marching and appearance of the troops onsidering the hard fieldwork they had been or five months and that many of them were old young conscripts. The march past occupied o hours, after which General Nogi and staff, ion and brigade commanders and the attachés, he house formerly occupied by Lieutenantiov and partook of a luncheon, thus terminateresting day.

population in evidence at the time of the uch larger than anticipated. They all looked essed, and included a number of women and showed the slightest signs of distress, and vere interested spectators of the review.

oer of the Russian civil population was enig out of Port Arthur, many in carriages rying their personal effects.' Among them f women and children. Nearly every buildboth in the old and new town, floated the

Red Cross flag, and large numbers of patients could b peering from doors and windows at the unwonted sp of a triumphant army entering their town. Along the w front, at the foot of Quail Hill, lay the remains of th magnificent Russian fleet, the ships tilted at all ang with decks awash and the muzzles of their turret gun water, their upper works riddled and torn by shot an a pitiful picture of wreck and ruin.

From outward appearances the buildings did not ap to have suffered extensively. Only along the water f of the old town a number of buildings were seen that w badly wrecked or destroyed by fire. This was no d caused by the 28-cm. shells while firing at the ships. A other points it required a rather close inspection to s shot marks, although most buildings of importance had struck a number of times. In connection with the subje the bombardment of the town it should be mentioned under date of December 14 General Stoessel addre letter to General Nogi charging that the Japanese were fi upon buildings distinctly marked by the Red Cro and on the 16th sent General Balashov, chief of the Ru Red Cross in Port Arthur, as a parlementaire to fur discuss this subject at Shuishihying. The Russians char that the Japanese were directing their fire intention against the hospital buildings. The Japanese denied th charge and stated that if hospitals were occasionally str it was because of their inability to control the deviation their heavy ordnance, which was becoming somewhat ir regular due to erosion. Considerable correspondence pa on the subject, being terminated on the 22d by the Japanes who agreed that they would under no circumstances fire up a hospital building intentionally unless they learned th such building was being put to improper use.

That hospital buildings were frequently struck is beyo question, but that they were fired at intentionally by th Japanese is far from being proved. In the first place, it should be remembered that the Russian hospitals were sca tered pretty generally through the new and old towns, in clo proximity to barracks, storehouses, and administration buil ings, which were legitimate targets for the Japanese artil

Under such circumstances it can hardly be wondered at
spitals were frequently struck. Speaking of this mat-
erchant admitted that the Russians were at fault for
ing segregated their hospitals in some definite quar-
egarding the effect of the Japanese bombardment
civil population, it appears from the best informa-
ainable that about 250 casualties occurred. The
he population continued to reside in the city until
f the siege, save only a few women and children who
oved to Chinese villages at Laotiehshan after the
n of 203-Meter Hill and the establishment of the
siege batteries at this point. Up to this time the
had suffered but little from the bombardment of
atteries.

14th of January the Japanese conducted a general
service, which was most simple and impressive.
noll to the northeast of Shuishihying an altar or
sisting of a plain unpainted pine shaft or post
ches square, set in a pedestal of sand bags, had
d. Before this shaft was a rough board table
h unbleached cotton cloth containing offerings of
d cakes. An approach some 10 feet wide and 20
anked on each side by heavy shell picked up in
, completed the arrangements. Representative
ll the organizations of the Japanese army were
an immense hollow square around the shrine. At
eneral Nogi and his chief of staff reverently ap-
shrine, and, after executing a military salute,
picked up a roll of writing from the table and
stinct voice read out what I presumed to be an
the spirits of the soldiers who had fallen in the
the reading was in progress a line of priests on
the approach chanted a prayer or ritual in
r completing his address General Nogi again
en retired. At this moment a shifting cloud
hilly fog which had hung about the hills since
l, and the sun broke forth from a clear sky.
eral Nogi his division and brigade command-
e attachés singly and in turn approached the
uted. The troops, without arms, were then

marched up by detachments under their noncommissioned officers and halted before the shrine, the senior noncommissioned officer advancing and saluting, after which he marched off his detachment, which was promptly followed by another. The entire ceremony was most affecting and impressive. After the termination of the service the officers of the army, to the number of some 1,800, assembled in an inclosure on the outskirts of Shuishihying and devoted the remainder of the day to feasting and merrymaking.

In the first weeks following the surrender the Japanese troops busied themselves in erecting monuments to their dead, and soon many of these simple affairs could be seen at many points on the hill tops or points where fierce fighting had occurred. Each division erected a divisional monument, some of which were rather elaborate. Besides the divisional monuments, there were many regimental and battery monuments marking the graves of the dead or the scene of combat.

The movement of the troops of General Nogi's army to the north commenced about the middle of January, after which time battalions and regiments in full marching order could be seen daily moving off to join the armies on the *Shaho*. By the end of the month practically the entire army had moved off, with all its trains and artillery, leaving only *some fortress* artillery and one Kobi brigade as a garrison at Port Arthur. During the middle of February the Kobi brigade *also* departed for the north.

On January 24 the headquarters left for *Liaoyang*, followed on the 30th by three attachés. Special permission was accorded to Capt. Sir Alexander Bannerman, R. E., *and myself* to remain at Port Arthur until February 15, subsequently extended to March 1, to enable us to continue our *work of* studying the Russian works of defense, which we prosecuted unremittingly. We were assigned quarters in the new *town* in a small house, which had evidently been used as officers' quarters by Russians, and moved in from Tsochiatien on January 31. Armed with a permit from General Idichi, who had been appointed governor of Port Arthur, we were enabled to visit all the Russian forts and trenches, including the seacoast forts.

ıat follows it is proposed to describe in some detail
cipal features of the Russian defenses, commencing
right flank of the land defenses, as shown on Plate
I, and following the line until the circuit is com-

ght flank of the Russian land line rested on the sea at
nore than 2½ miles east from the harbor entrance.
sea a strong trench runs along rising ground to a
upon which is located the southeast redoubt (Pl.
This trench is revetted with sand bags and stone
led with splinterproof overhead cover of the type
mployed by the Russians. In front of this trench
e line of wire entanglement. This work is an ex-
cimen of a field redoubt, built wholly of timber
Its artillery armament consists of four 47-mm.
guns on naval mounts in blinded emplacements.
s amply provided with bombproofs, quarters, and
The construction of the work is sufficiently ex-
he drawings. It was not attacked and was quite

southeast redoubt a trench runs northwest to
the Paiyinshan old fort, as shown. The wire
t in front of this trench is doubled and at 12 are
rapid-fire naval guns. To avoid confusion and
nay be here stated that Plate XXXVII affords a
accurate representation of the several lines of
batteries, both inner and outer. By reference to
ding numbers on the armament sheet appended
XVII, the equipment of the different batteries
e obtained.

shan old fort (Pl. XIV) is a wide, shallow
frontage of about 850 feet. The .work con-
y battery for four 15-cm. siege guns mounted
le garrison carriages at the left end of the
o 5-barreled revolving cannon are mounted
rapet at the right end. The front and flank
pt by two counterscarp galleries at the sali-
lleries could not be entered owing to Rus-
the ditches not yet removed at the time of
e gorge ditch is flanked by an open timber

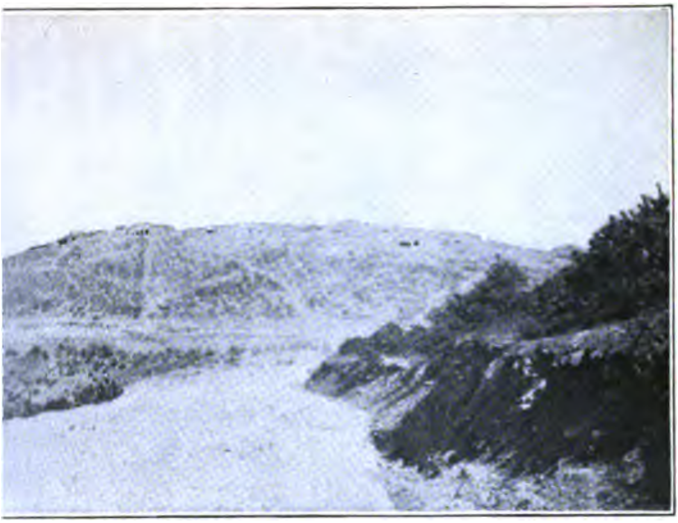
caponier entered by a descending gallery from the ter- plein. The masonry quarters are located about the mi of the front of the fort on a series of levels to suit t natural configuration of the ground. The entrances to t quarters are protected against splinters by concrete p- cochères. The parapets on the gorge and flanks a revetted with empty cement barrels, while those of t front have stone and sand-bag revetments. The ditche the work are cut from the natural rock, and are of vary depths from 12 to 25 feet. The thickness of the infan parapet at the top is very small, not over 3 feet. T magazine on the right side is of concrete, with floor ab 3 feet below the terreplein. Except for a temporary sa bag mass on the left side the magazine was uncove The magazine on the left side is merely sunk in the r and covered over so as to render it bombproof. The f contains two electric plants, one in the magazine on right and the other sunk close to the parapet of the flank. The former consists of a direct-coupled unit a horizontal boiler and the latter of a very small belt u the boiler and engine coming from a portable outfit. T fort is entered from the gorge by a wooden bridge acr the ditch and ramp up the exterior slope of the parap This fort was beyond the sphere of the Japanese operati and bore no evidences of having been bombarded.

On the hill next to the left is a group of trenches wh were designated as the Paiyinshan new fort, although th is no fort. These trenches are all very strong, with overh splinter-proof cover. The line of wire entanglement runs c tinuously along the entire front, doubled and tripled places, as shown in the plate. Back of the Paiyinshan fo on higher ground are trenches and batteries constituting second line of defense. Among the batteries is one conta ing two 15-cm. naval guns, numbered 15 on Plate XXXVI

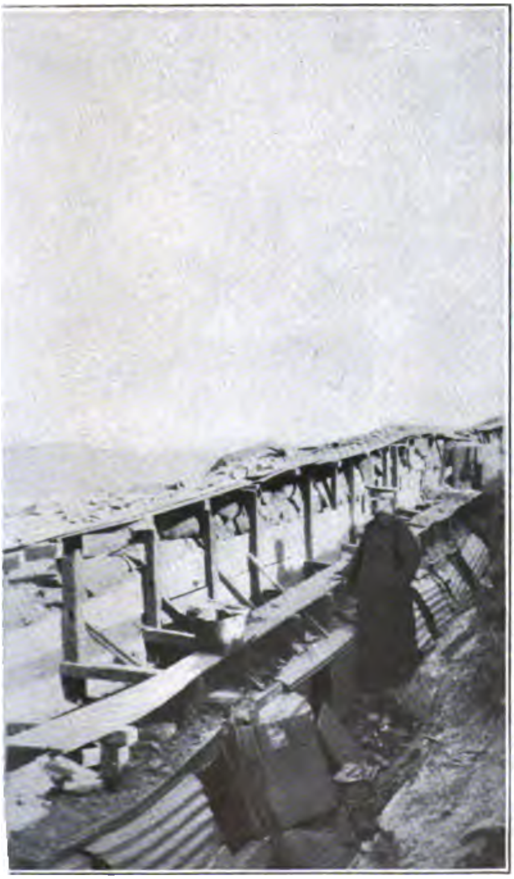
Next to the left from the Paiyinshan new fort comes t Paiyinshan north fort (Pl. XV), or rather battery, whi is of concrete, for six 15-cm. siege guns, on front pintle gar rison carriage, of which but three guns were in position. On emplacement contained a damaged carriage, and a burst gu lay in rear of the battery. Close behind the battery the had been an electric plant housed in a wooden structu

47. PAIYINSHAN, OLD FORT, VIEWED FROM REAR.

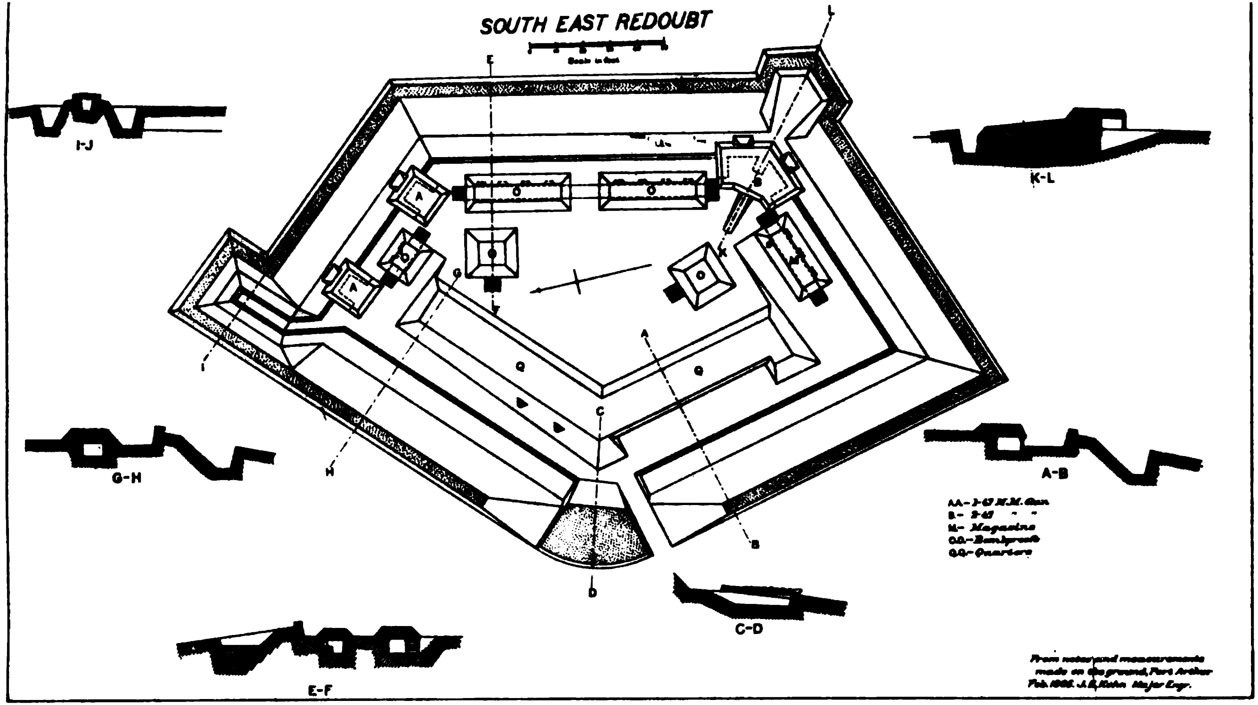
N (COCKSCOMB HEIGHT), SOUTHEAST FORT, VIEWED FROM INSIDE
WING WALL, RUSSIAN BOMBPROOFS, AND CHINESE PACK TRAIN.



TUNGCHIKUANSHAN, SOUTHEAST FORT, VIEWED FROM REAR.



VANCED TRENCH, EAST TUNGCHIKUANSHAN FORT.

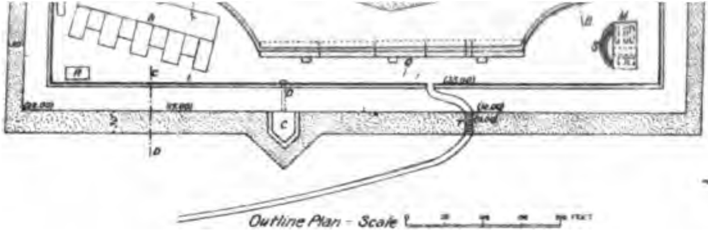


From notes and measurements made on the ground, Port Arthur Feb. 1905. J. E. Kuhn Major Engr.

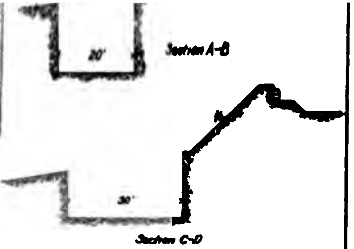
PLATE XIII

STANFORD LIBRARIES

R	Uncovered Stone House
O	Casemated Quarters
S	Sand Bag Cover
C	Timber Caponier
G.C.	Counterscarp Galleries
T	Bridge
D.	Inclined Gallery



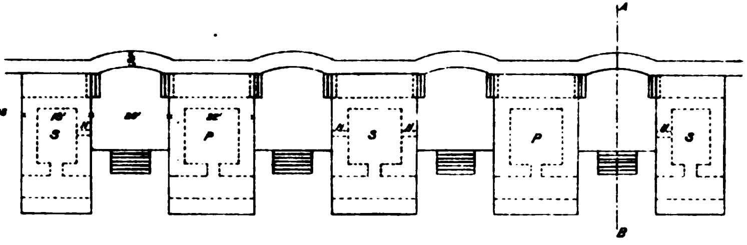
Outline Plan - Scale

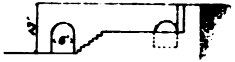


Section A-B

Section C-D

S	Shell Rooms
P	Powder "
H	Shell Hoist

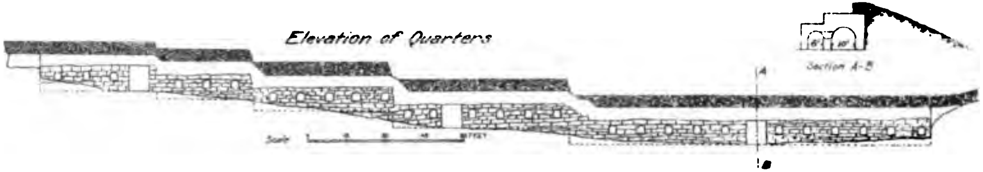




Section A-B

Battery for Four 15 C.M. Siege Guns.

Scale



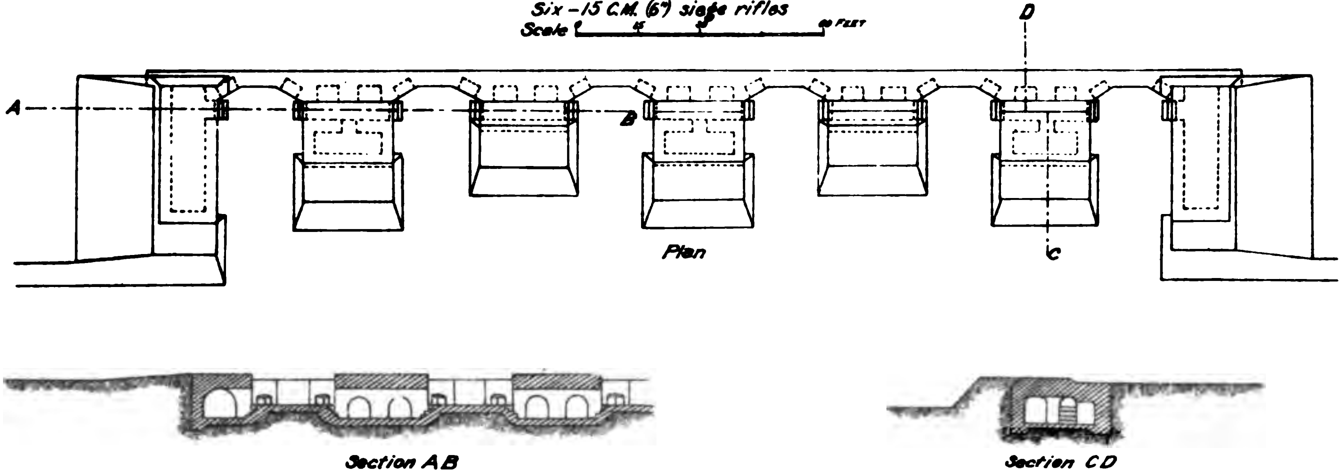
Elevation of Quarters

PLATE XIV

STANFORD LIBRARIES

Paiyinshan, North Fort

Six – 15 C.M. (6") siege rifles



From notes & measurements
made on the ground.

Joseph E. Kuhn,
Major of Engineers
February 1905.

PLATE XV

had been set on fire and destroyed. Outside the con-
attery and to the left were a 15-cm. and a 10.5-cm.
ifle on wheeled mounts. The Paiyinshan north battery
me in for a fair share of the Japanese bombardment.
gh the ground was more or less torn up and the con-
itted and broken on corners and edges, none of the
ines or passages had been injured. As noted above,
f the armament had been placed hors de combat.

ind the Paiyinshan north fort begins the Chinese wall,
runs continuously from this point to beyond Sung-
n.

ond the forts and works of the Paiyinshan district
those of the Tungchikuanshan district, sometimes
the Cockscomb forts. The first of these is known as
east Tungchikuanshan. This is merely an open battery
arth parapet revetted with stone or sand bags, occu-
a considerable elevation, from which an effective flank-
e can be brought to bear on the remaining Tungchiku-
n forts farther west. This battery was an important
in checking the Japanese assaults on these forts, and
gh the battery was severly bombarded throughout the
and much of the armament knocked out, the Russians
n mounting guns.

the reverse slope of the hill were a number of excel-
ombproofs strongly built and well sheltered, as shown
photograph herewith.

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rectangular trace and to have mounted either four
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who fired the work during the night of January 1-2.
attery was surrounded by the old Chinese wall which
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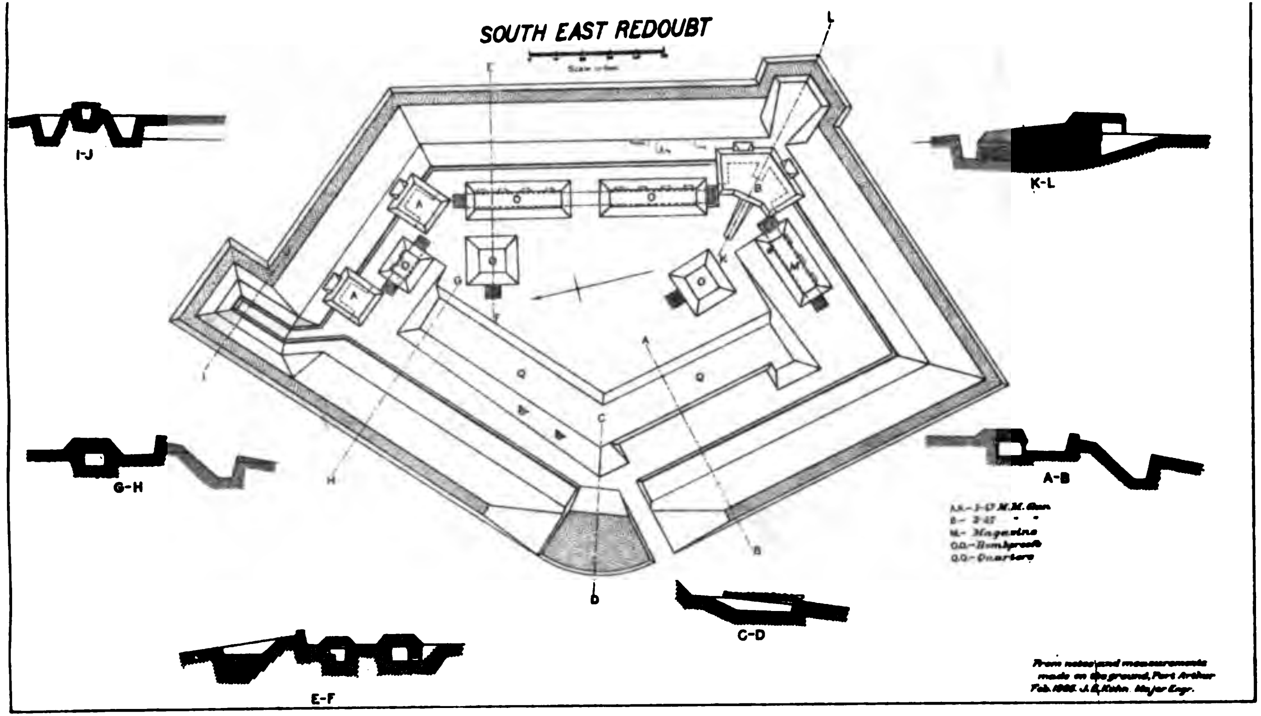
se, however, was made from a strong trench outside
d lower down from the Chinese wall. This trench
f great depth, as shown by photographic view. The
h was traversed with sand bags and plate iron set on
between the sand bags, and was provided with over-
splinterproof cover. Beneath the banquette and in

STANFORD LIBRARIES



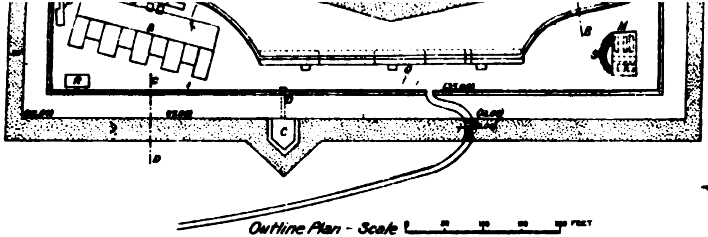
A.A.– 3-47 M. M. Gun
B.– 2-47 " "
M.– Magazine
O.O.– Bombproofs
Q.Q.– Quarters

From notes and measurements
made on the ground, Port Arthur
Feb. 1905. J. B. Kuhn. Major Engr.

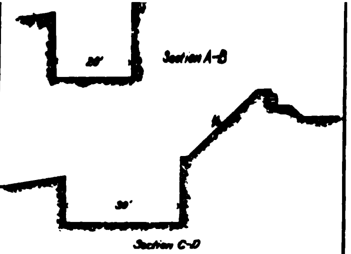
PLATE XIII

STANFORD LIBRARIES

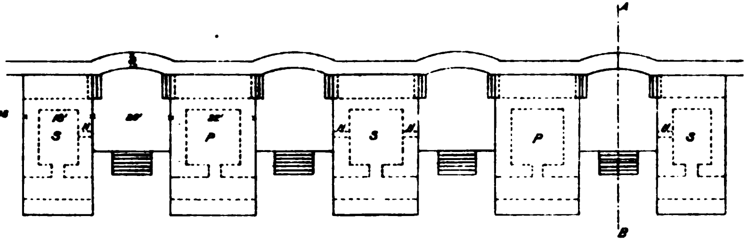
P	Sunken electric Power Plant
R	Uncovered Stone House
Q	Casemated Quarters
S	Sand Bag Cover
C	Timber Caponier
G.C.	Counterscarp Galleries
T	Bridge
D.	Inclined Gallery



Outline Plan - Scale

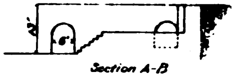


S	Shell Rooms
P	Powder "
H	Shell Hoist



Battery for Four 15 C.M. Siege Guns.

Scale



Elevation of Quarters

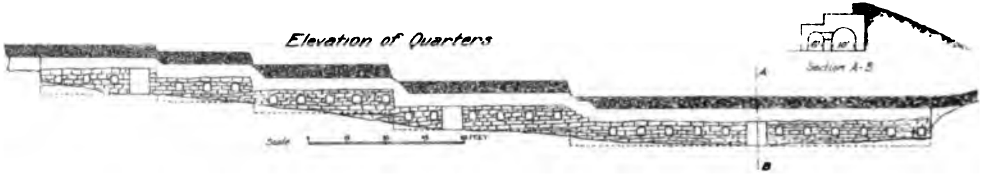


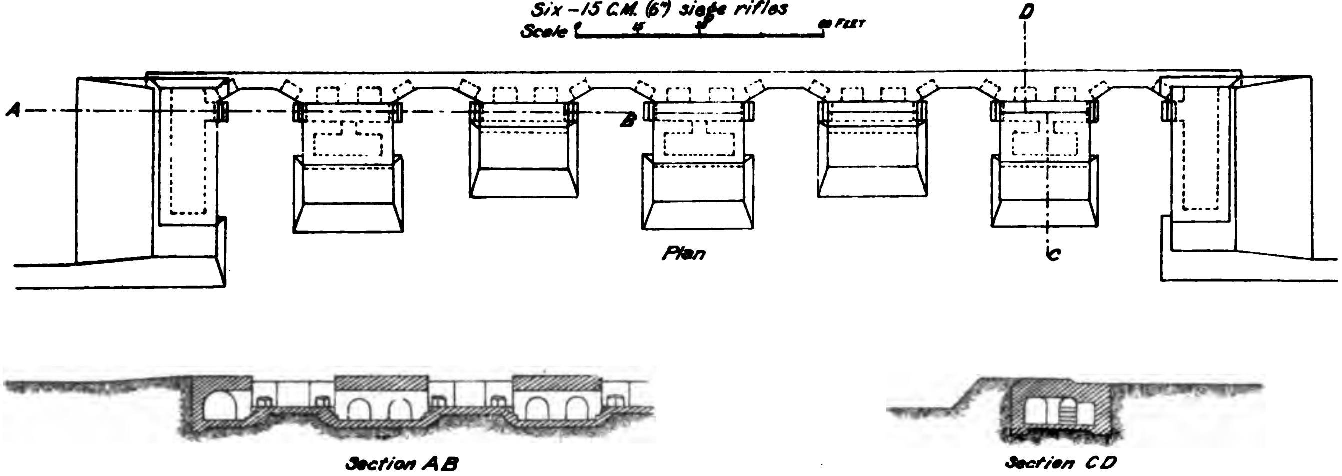
PLATE XIV

STANFORD LIBRARIES

PLATE XIV

Paiyinshan, North Fort

Six – 15 C.M. (6") siege rifles



From notes & measurements made on the ground.

Joseph E. Kuhn,
Major of Engineers
February 1905.

PLATE XV

STANFORD LIBRARIES

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of great depth, as shown by photographic view. The
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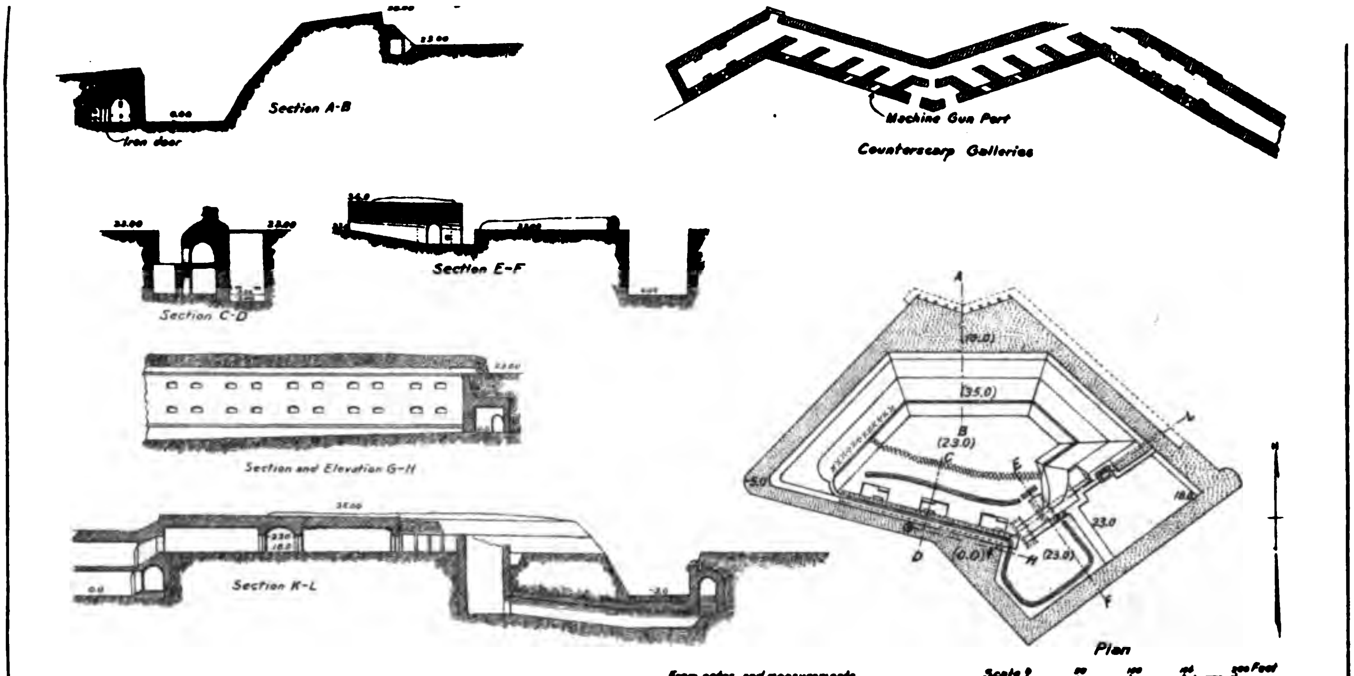
between the sand bags, and was provided with over-
l splinterproof cover. Beneath the banquette and in

the reverse slope
of the frenches
Japanese twice,
on the latter occ
yards from the
vember but could
from southeast
the Japanese suf
corpses lay betwe
bearing mute but
at this point. Bo
pounded by Japa
up by the shells.

Between east an
called by the Japa
had built a circula
ber, but without s
Japanese with the
18. In rear of thi
down to North Tu
a knoll which was
wall had been mo
splinter and bombp
along it. This cons

Battery Q was a
On the latter occasi
pet and engaged th
annihilated.

On the left of Ba
a masonry fort wi
trace of the work i
two flanks, and a b
in rear of one of the
face are the casemate
counterscarp gallerie
galleries are reached
ditch. The ditches a
of 3 : 2 for the counte
At intervals along t
proofs, 12 feet long,
floor some 3 feet belo



From notes and measurements
made on the ground.
Port Arthur. January 1905
Joseph E. Kuhn.
Maj. of Eng. U.S.A.

PLATE XVI

STANFORD LIBRARIES

work was in an unfinished state, the casemated quar-
the gorge being wholly uncovered, except for a sand-
arapet laid on the crown of the arch. These quarters
o tiers high. Three large pits had been excavated in
rreplein adjoining the casemated quarters, as shown in
CD. These were evidently intended for magazines
orerooms. The west gorge ditch is flanked by a cham-
der the place of arms, having communication with the
ated quarters. The gorge ditch is 25 feet deep at the
rscarp at the deepest place. On the east flank the
rscarp is but 10 feet high. The work has a covered
nd infantry parapet on top of the counterscarp. The
bag parapet on top of the casemated quarters was con-
l around the perimeter of the place of arms, as shown.
nterior of the work had also been retrenched by a sand-
arapet near the gorge, with wire entanglements in front.
re entanglement had also been constructed on the su-
slope of the west flank. In the west gorge ditch there
high, strong iron fence, made of pinch bars, barring
assage. Along the scarp of the east flank was found
obsolete obstacle known in text-books as a fraise, or
ontal palisade. The arrangement of the counterscarp
ies will be understood from the enlarged plan. At
end of the face counterscarp galleries are starting points
untermines.

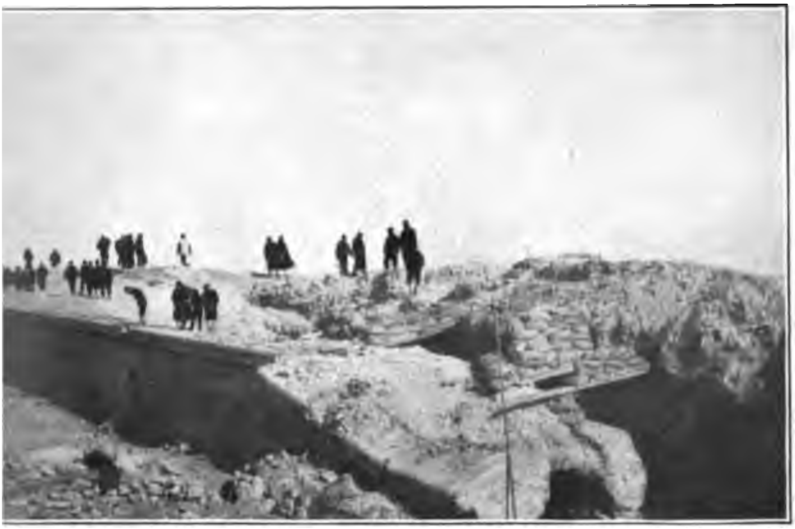
en the Japanese saps had reached the northwest corner
e ditch a mine shaft was sunk in the glacis and a gallery
d toward the counterscarp. The Russians meanwhile
d a countermine at this point, their gallery being a few
lower than that of the Japanese. When the Japanese
ry reached the countermine the latter was fired, breaking
the Japanese gallery. The Japanese then took posses-
of the Russian countermine gallery and entered the
terscarp gallery at the salient. The Russians in the
time had withdrawn to the farther end of the counter-
gallery along the east face, where they had erected a
-bag parapet, from which they could fire along this gal-

To dislodge them the Japanese constructed a sand-bag
pet at the front end of the gallery by tossing in sand-
, which were first built up by a single sapper, who started
arapet lying down on his back. After the parapet had

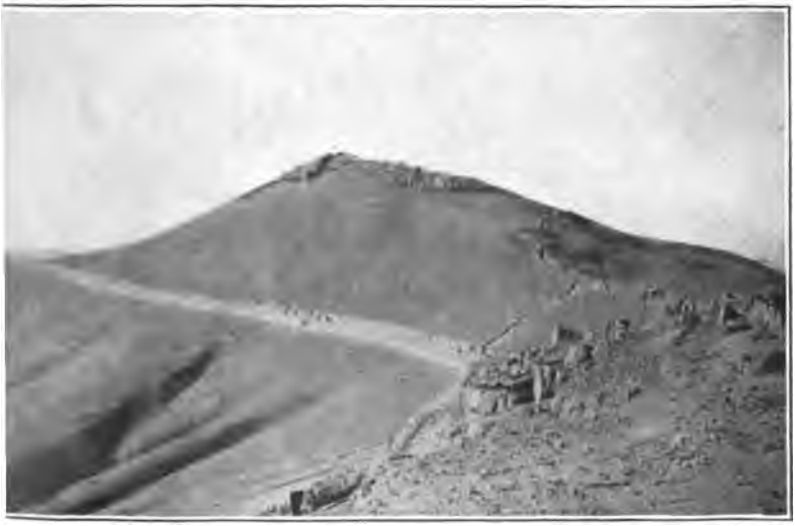
been finished
behind this pa
Russians from
their end of th
into the fort und
make this clear.
the northeast cor
face scarp. A m
corner of the para
mine was the signa
The assault proved a
and two larger mine
18 and the work succe
that General Kondrato
ber 3. It was also the
hands of the Japanese.
8.7-cm. field guns, two
rapid-fire guns, and four

On the left of North Tu
which is crowned by the C
with by two branches. Thi
first, but changed to Fort Ic
ber 31 by the Sixth Brigad
Russian trenches on the fro
work was somewhat difficult
quent Japanese works. Its ap
Plate XXXVII. The Japanese
the work, behind which were mo
guns and one 15-cm. mortar. Th
the masonry gorge of North Tun
oblique view could be had from P
ment remaining in the fort at ti
3-inch field gun. The main Chines
from the gorge of the work, and the
are about the same distance apart w
The Japanese had carried saps a sho
branches toward the wall.

Inside the Chinese wall in rear of E
on the crest of a ridge, was a battery of t
called Battery R. Both of the guns ha
Japanese artillery fire. On the ridge be

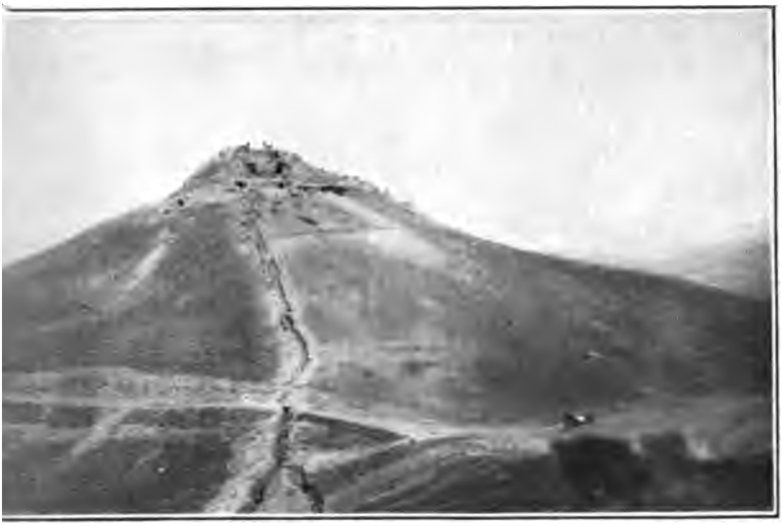


51. COUNTERSCARP GALLERY, NORTH TUNGCHIKUANSHAN FORT.

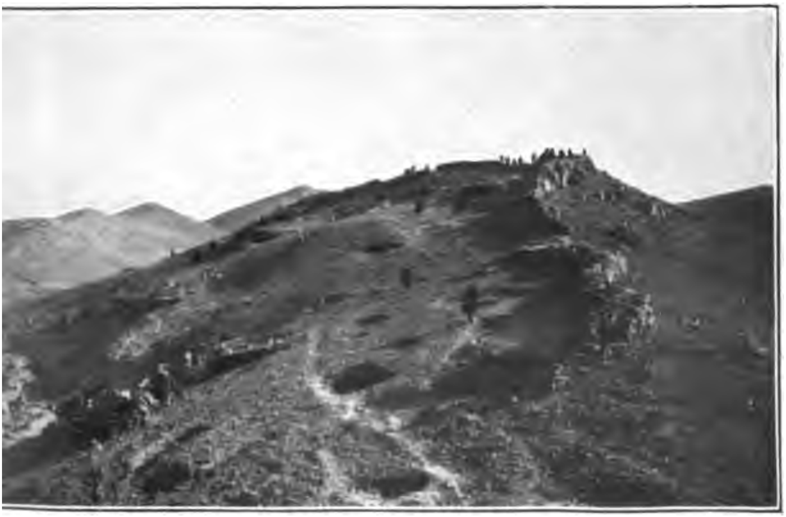


52. WANGTAI FORT, LOOKING WEST FROM BATTERY M.

STANFORD LIBRARIES



53. WANGTAI FORT, FROM SOUTH.



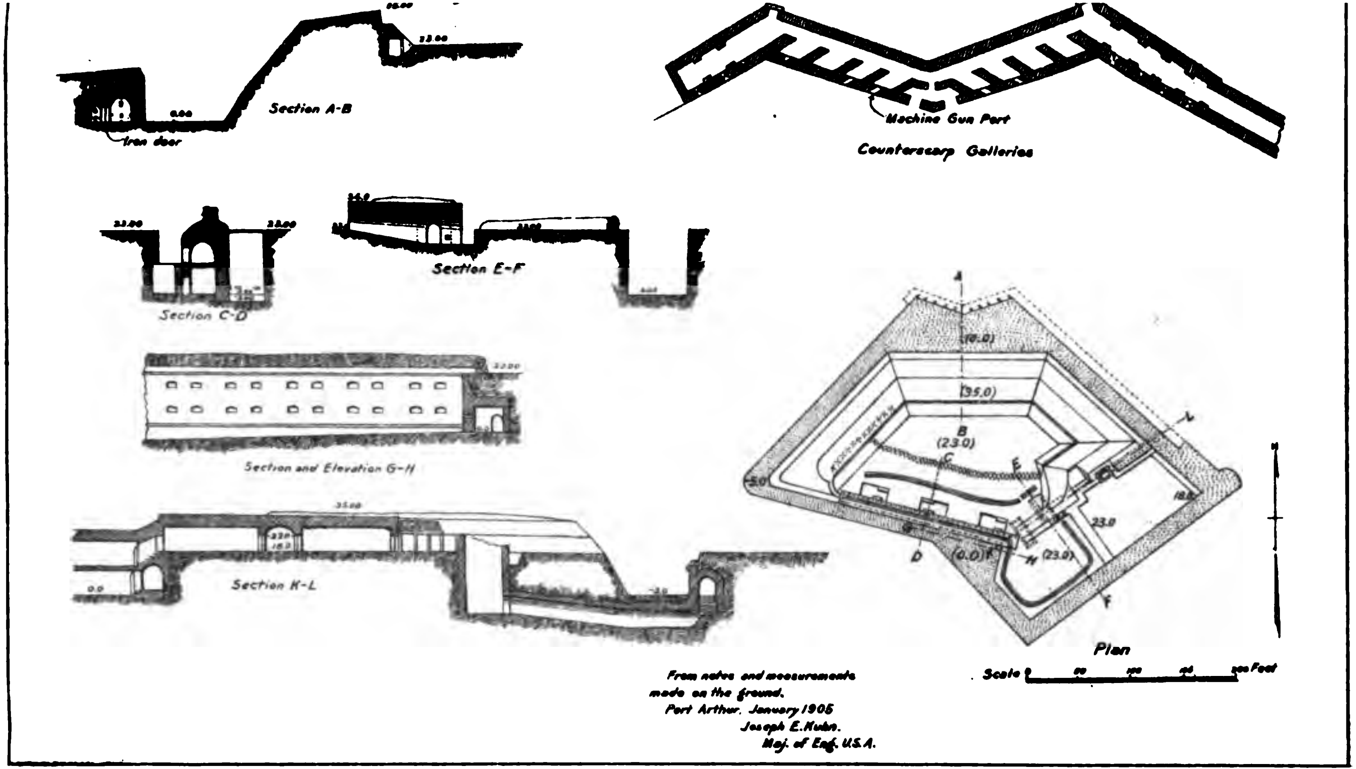
54. "RO"-"H"-"WANGTAI," FROM REAR OF ERHLUNGSHAN, LOOKING EAST.

the revers
of the tre
Japanese t
on the latte
yards from
vember but c
from southeas
the Japanese s
corpses lay betw
bearing mute but
at this point. Bo
pounded by Japan
up by the shells.

Between east and
called by the Japanes
had built a circular t
ber, but without succe
Japanese with the fall
18. In rear of this kno
down to North Tungchi
a knoll which was desig
wall had been modified a
splinter and bombproof cov
along it. This constituted

Battery Q was assaulted
On the latter occasion a party
pet and engaged the Russians
annihilated.

On the left of Battery Q com
a masonry fort with polygona
trace of the work is an irregula
two flanks, and a broken gorge.
in rear of one of the gorge faces, wh
face are the casemated quarters. T
counterscarp galleries at the front a
galleries are reached from the gorge
ditch. The ditches are cut from the na
of 3 : 2 for the counterscarp and somew
At intervals along the face and flank
proofs, 12 feet long, 4 feet wide, and 5
floor some 3 feet below the terreplein.



From notes and measurements
made on the ground.
Port Arthur. January 1905
Joseph E. Kuhn.
Maj. of Eng. U.S.A.

PLATE XVI

contained four e mounts. Only o wrecks of three g the work. Ro B for field guns wit

Between H and the two, was a ba designated as the curious whining n about the only o cated with any co the Japanese had ravine in rear, th covered with shel by shell craters. diameter and 10 Timber magazines well as the trave platforms were of bedplate. In the found this battery combat. The last only on December tery on January 3 lying about the g a shell in the act on the loading pl located the guns torms being poorly

Next west from work like the Panl by assault on Oct ping. The work rear by a zigzag o by the Russians a Japanese using the was found in G aft

The next work i and strongest of th (Pl. XVII). The

5. ERHLUNGSHAN (TWO-DRAGON), VIEWED FROM WEST PANLUNGSHAN.

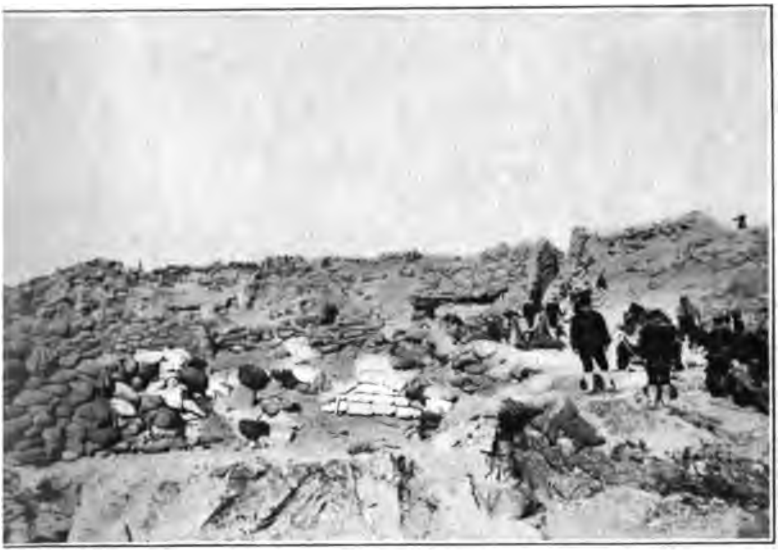
56. ERHLUNGSHAN, FROM REAR.

STANFORD LIBRARIES

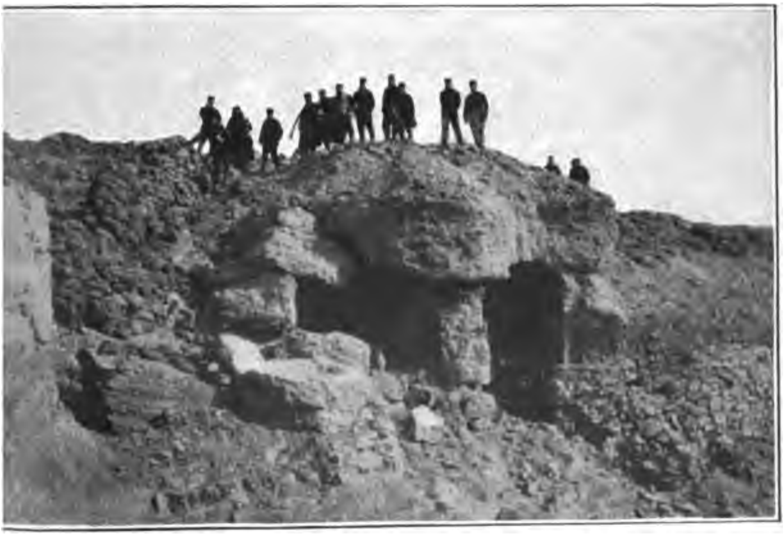
a face, two flanks, and a salient gorge, with a place of
t the latter. As in the other works, the ditches are cut
living rock without revetments, save at a few places
he counterscarp, where a dry rubble wall had been built
ease the depth. The material excavated from the
ad been deposited in the glacis, which is of irregular
from 75 to 150 feet. The glacis has a steep and high
r slope, which leaves a dead space under the parapet,
is, however, covered by the fire from the adjoining
The Russians had constructed a strong trench around
er edge of the glacis, with ample overhead cover. This
en pretty well effaced by subsequent operations, but
ns were still in evidence. Well down the slope near
ilway line the Russians also had an advanced trench,
later served the Japanese as a parallel. The ditches
fort are both wide and deep, being cut 25 feet into the
d on the flanks. The ditch at the face is some 5 feet
than on the flanks, to cover the gallery leading to the
rscarp galleries. The gorge ditch is nearly 10 feet
than the flank ditches and connects with them by
slopes. Both gorge ditches are barred by strong high
fences. The ditches are thoroughly flanked by two
rscarp galleries at the salient and by two casemates
the place of arms at the gorge. Access to the front
rscarp galleries from the parade is from a concrete
d and descending gallery, passing across the ditch.
r the two gorge faces are the casemated quarters, which
ached by a gallery rising to the parade and terminating
T-head behind the heavy gun line. The latter extends
en the two flanks and provides emplacements for four
. siege guns on wheeled mounts. The battery is of
ete, with magazines and bombproofs under the trav-
The gun crest is higher than any part of the work
ires over the front parapet, which is some 10 feet lower.
west gorge casemates have 6 ports and 3 oblique loop-
, while the east gorge casemates have 7 ports and 4
ue loopholes. The ports are closed by one-half inch
d steel plates, having 9 by 2 inch loopholes. At the
ends of the two flank ditches are concrete drains to carry
e drainage. The Russians had constructed a sand-bag

parapet ar
on the glac
The front
saps which
were of great
After the Ja
a mine on the
east salient and
was then lowered
front of the cham
They also sank two
blowing in the sam
galleries and a like
the front parapet, wh
ber 28, and the work c
stinately defending the
the gorge, and finally fr
glacis. A final remnant
have shut themselves in t
refused to surrender unti
mables thrown through th
field and machine guns were
its capture.

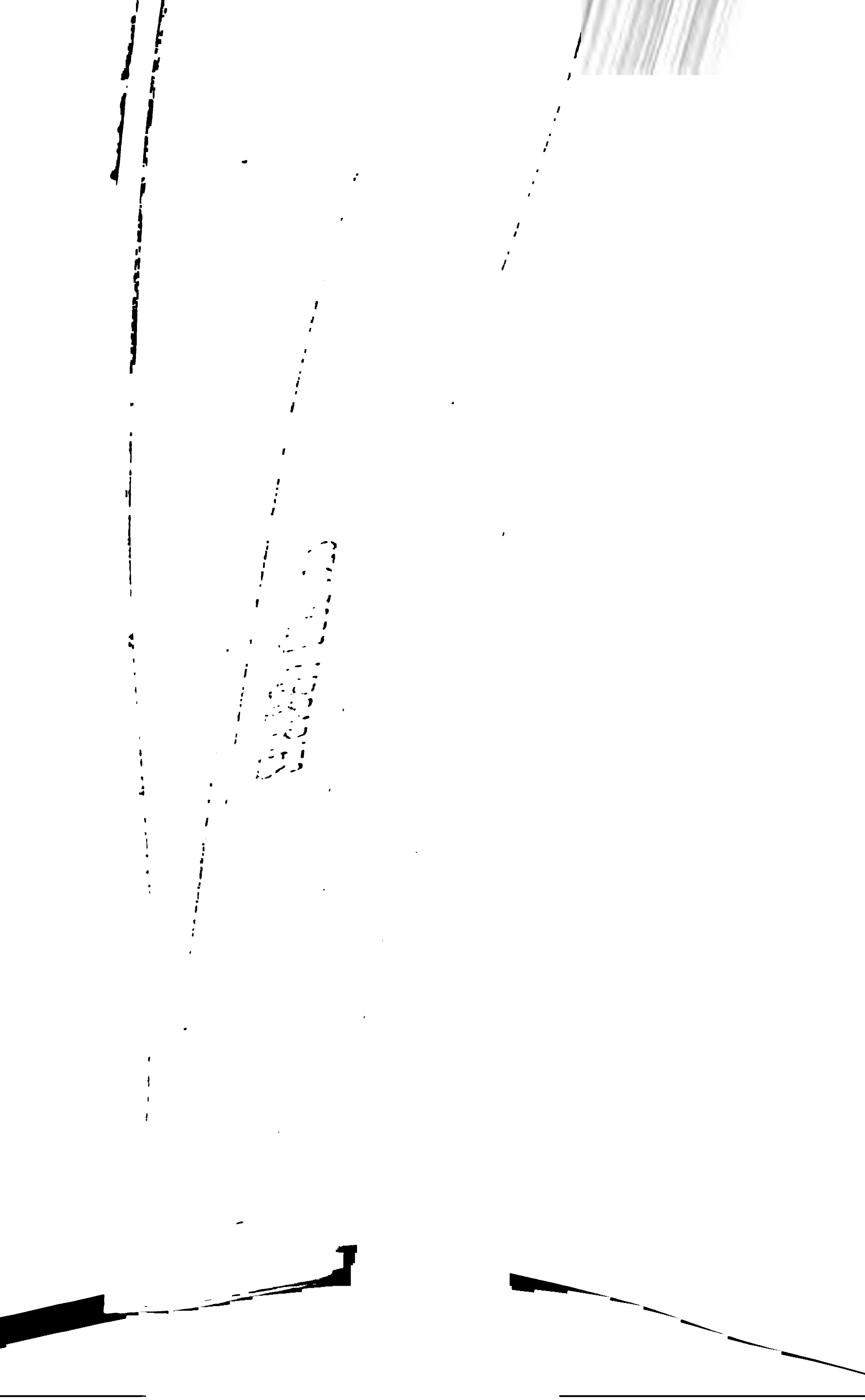
On the left of Erhlungshan
the last of the permanent wo
subjected to attack by regular
works along the front of atta
adapted to the configuration
practically in a triangle with
The ditches are cut in the natural
revetment, save at a few points wh
ness of the counterscarp have been
wall. The ditches, while not so w
Erhlungshan, are still very formidab
some 10 feet higher than those of the
by casemates located under a place
ditches are swept by counterscarp galler
masonry gallery extends from the gorge
scarp galleries at the face as shown in th
lery is reached from the parade by a T-hea

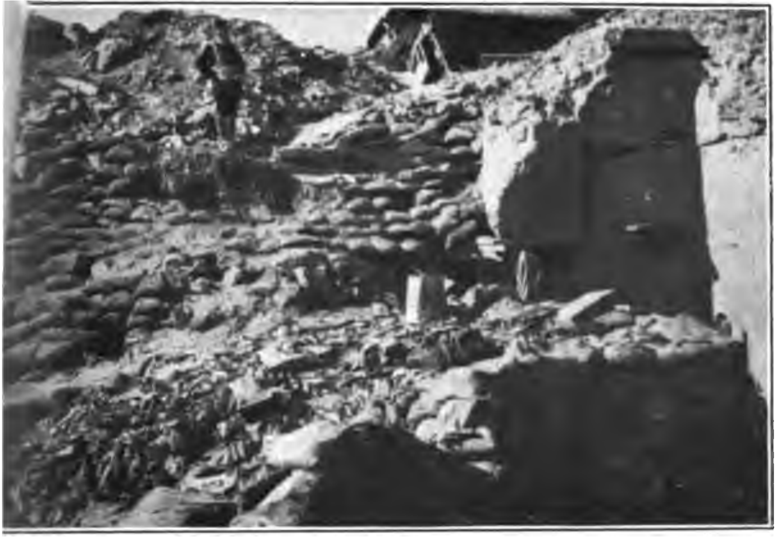


57. INTERIOR OF ERHLUNGSHAN, FROM HEAVY GUN LINE.

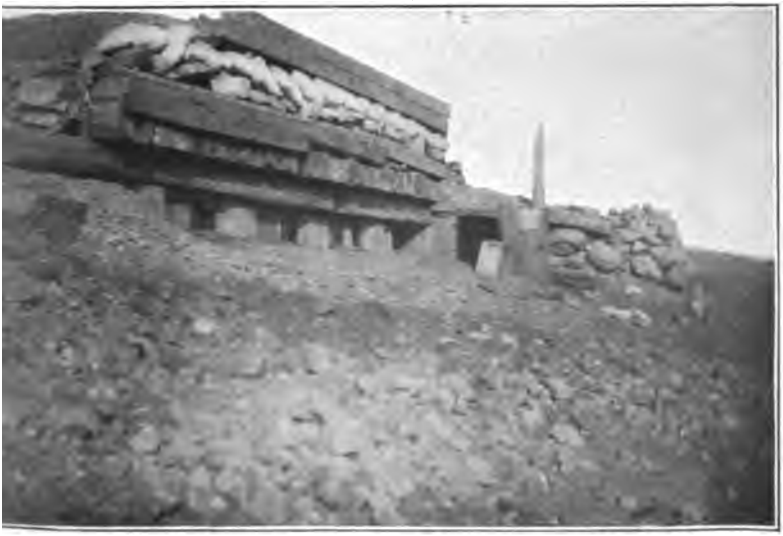


58. CAPONIER OF ERHLUNGSHAN, MINED BY JAPANESE.





59. EAST FACE CAPONIER, FORT SUNGSHUSHAN.



60. RUSSIAN BOMBPROOF, BACK OF FORT SUNGSHUSHAN.

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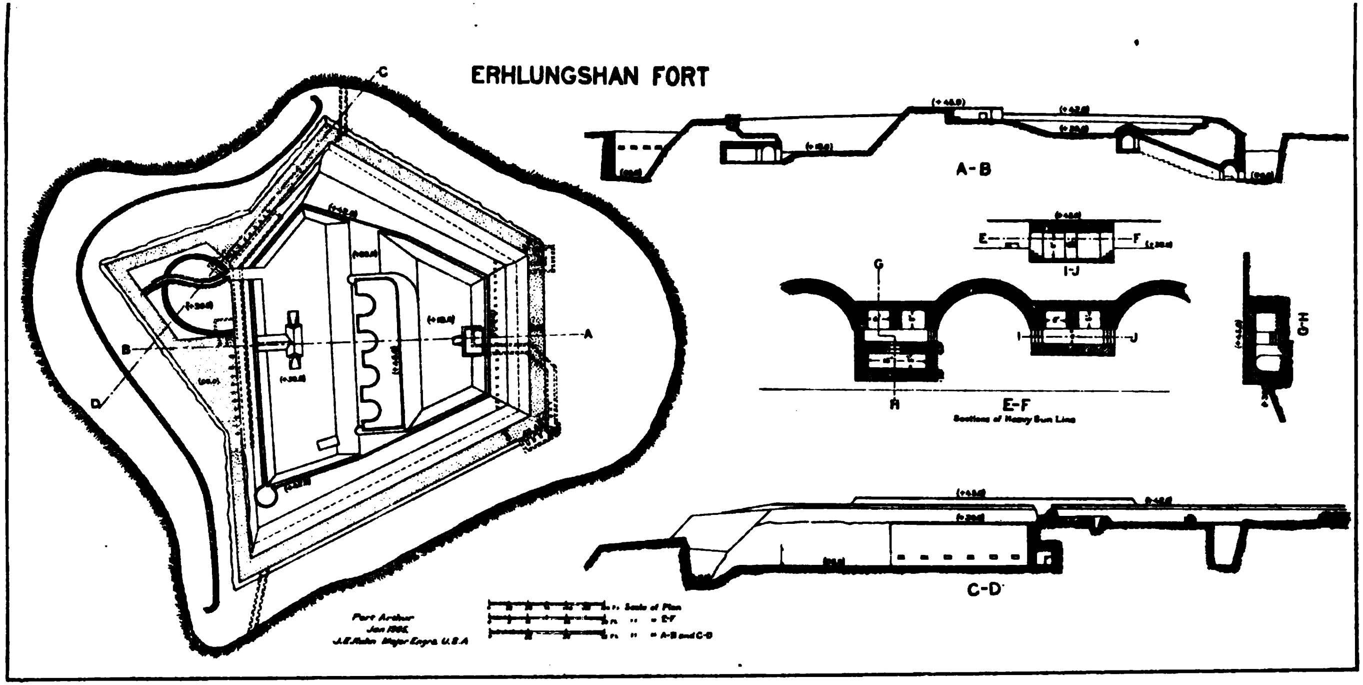
ERHLUNGSHAN FORT



Port Arthur
Jan 1905
J. E. Kuhn Major Engrs. U.S.A.

PLATE XVII

STANFORD LIBRARIES

ATE XVIII

STANFORD LIBRARIES

ent of the parapet the Russians had emplaced two
shielded naval guns. These had been put hors de
by the Japanese quite early in the artillery bombard-
nd were almost completely buried when the parapet
ned on December 31. The place of arms is connected
e parade by a tunnel under the gorge parapet. After
truction of the counterscarp galleries the Russians
up parapets at the rear ends of the flank ditches
the iron fences, from which they flanked the ditches
fantry fire. On the slopes leading to the fort and
50 yards in front the Russians had constructed a
infantry trench, and still lower down near the railroad
was another trench which was carried across the
between Erhlungshan and Sungshushan to connect
e lower trench in front of the former fort.

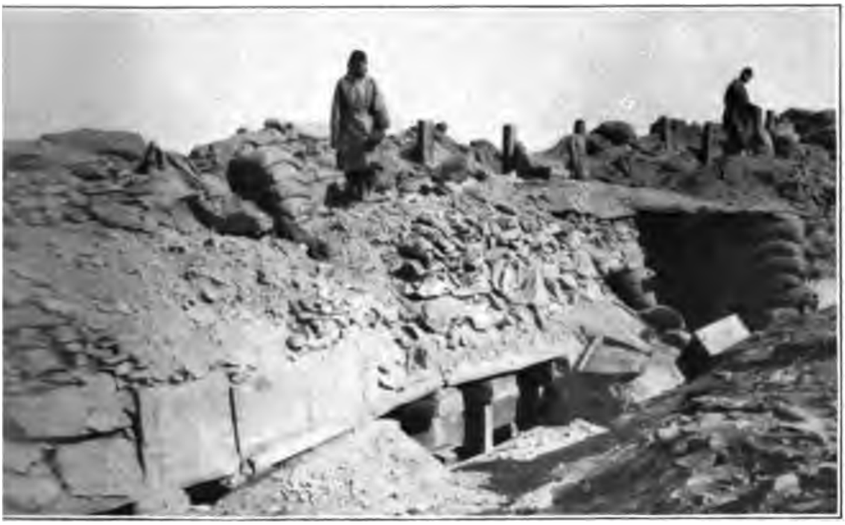
principal events leading to the capture of Sungshu-
re but a duplication of those in the case of Erhlung-
When the fort was mined on December 31, the Russian
ine near the gorge was exploded some seven minutes
lue, no doubt, to the flame and gases of the Japanese
oming by way of the communicating gallery extending
the parapet at the salient. The explosion of this mag-
lestroyed the exit of the garrison to the gorge ditch,
fter a brief struggle, the remnant surrendered. The
of arms suffered heavily from the Japanese artillery
ming from the west. A 28-cm. shell had evidently
out the east face of the place of arms and destroyed the
g casemate. This face was rebuilt with sand bags.

the forts on the front of attack had been heavily
ed for months by the Japanese artillery and their pro-
nocked out of all shape. The parapets were simply
lar heaps of earth and rock spawls in which the Rus-
maintained some form of infantry parapet by digging
iling sand bags. The glacis and ground immediately
nding the forts were all torn up, and where turf had
xisted there remained only a mass of comminuted rock
bling quarry spoil. The ditches were partly filled by
from the scarps and counterscarps brought down by
apanese artillery fire and were literally charnel pits in
the dead, both Russians and Japanese, had been
ed to get them out of the way.

Startin
following
are the b
nexed batt
anese direct
November
battery will
teries were su
ment by the J
out, and the ro
yard of dama
were so regular
the Russians res
field magazines
shell had landed
5 feet of earth an
of steel rails, and w

The Russians ma
nexed battery, the
XXXVII. The ren
found lying about.
taken from the ships a
power plant was on the
proof, which had been e
of a portable boiler and
dynamo. In the vicinity
wire entanglement and pa
soldiers' caps, showing tha
occurred here in the night

In front of Erhlungsha
railway, the Russians had
Fort Kuropatkin and the
works occupy low eminence
separating the main line of
nese lines of investment. Fo
doubt and is quite fully repr
tions on Plate XX. The Japa
to the work by sapping befo
assault on September 20. In a
erations, the Russians had starte
one flank of the fort, as shown in t



61. CHINESE WALL AT "H," SHOWING RUSSIAN BOMBPROOFS UNDER PARAPET.

62. NORTH TAIYANGKOU FORT, FROM SOUTH.

STANFORD LIBRARIES

ERHLUNGSHAN FORT

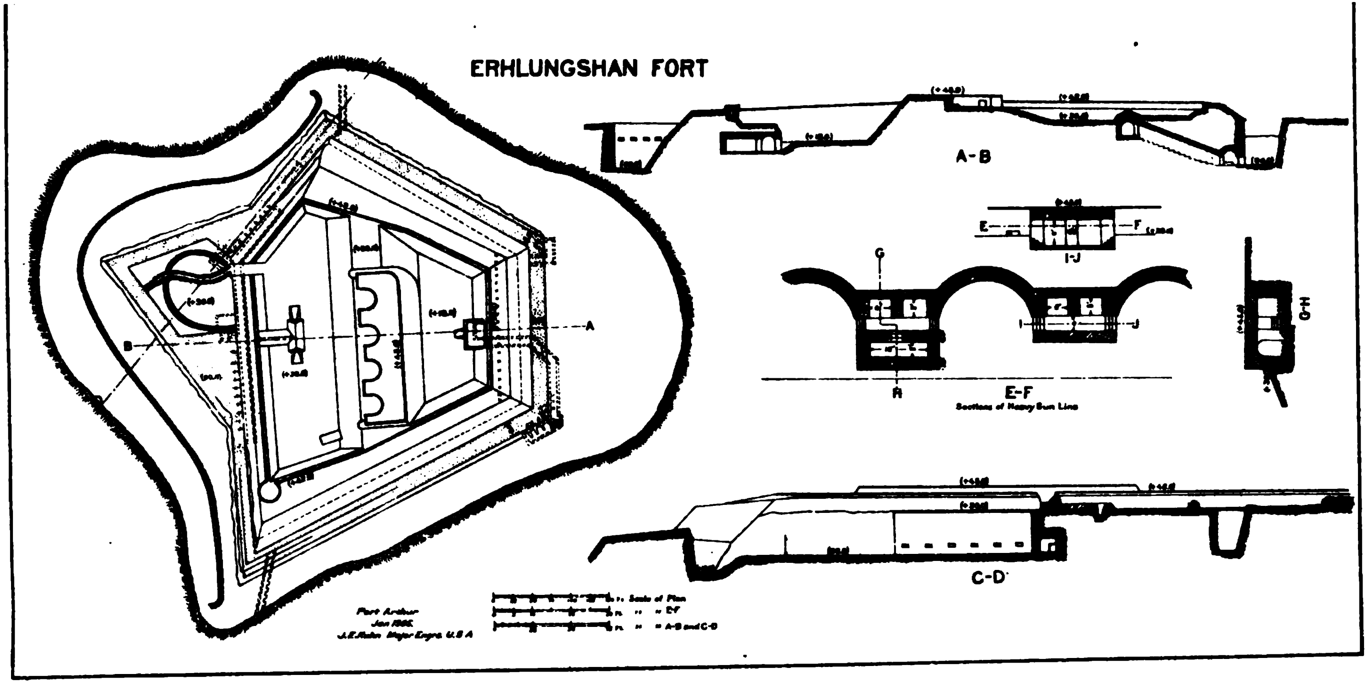


PLATE XVII

STANFORD LIBRARIES

ATE XVIII

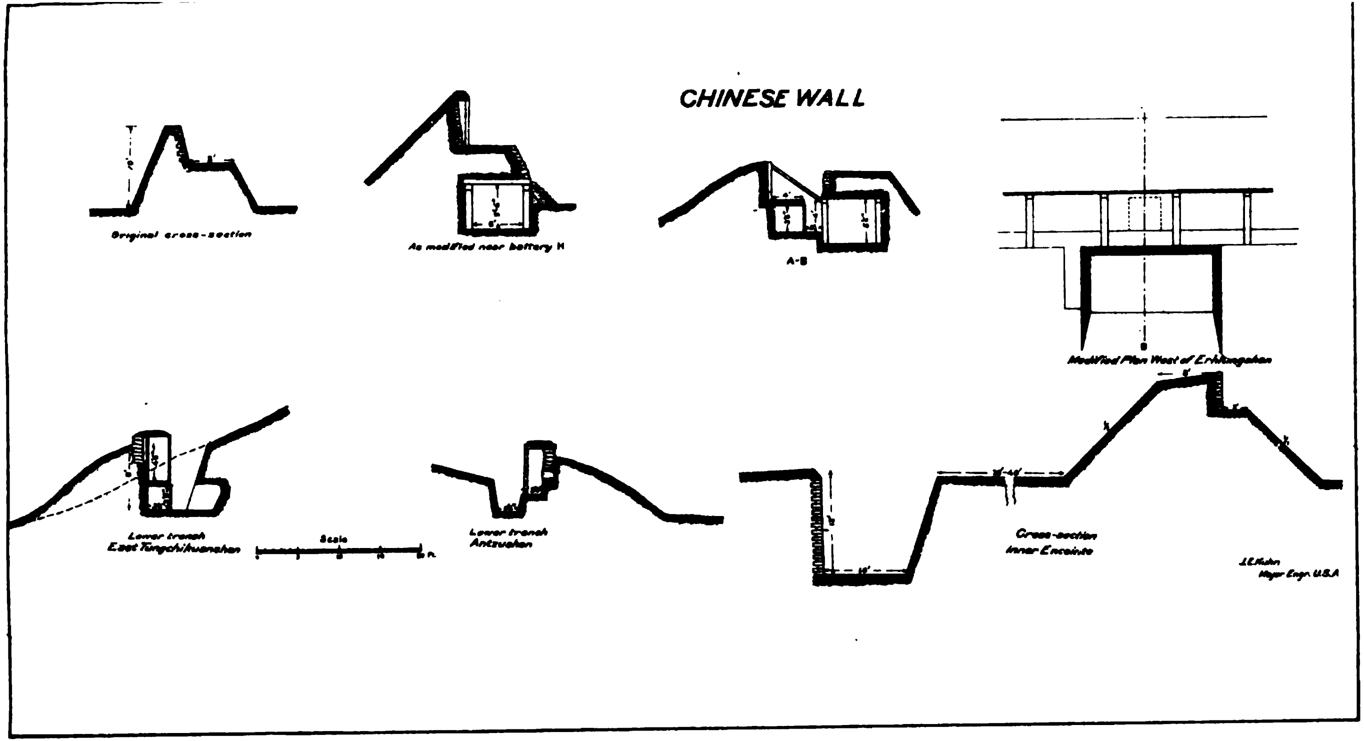

CHINESE WALL
Original cross-section
As modified near battery H
A-B
Modified Plan West of Erhlungshan
B
Lower trench
East Tungchikuanshan
Scale
ft.
Lower trench
Antzushan
Cross-section
Inner Enceinte
J. E. Kuhn
Major Engr. U.S.A.

PLATE XXI

STANFORD LIBRARIES

Fort Kuropatkin a strong trench runs south
rhlungshan, terminating on a small knoll near
ay. This knoll was designated the railway re-
so the red redoubt. It was not held after the fall
uropatkin.

ishihying redoubts consist of four lunettes placed
ation south of the village of that name. These
ad a strong profile, with ample bombproof cover.
us trench connects Fort Kuropatkin and the
rossing the low ground between. The Shuishi-
bts were carried by assault September 20, after
roach by sapping, at the same time as Fort
, resulting in the Russians abandoning the
e position, which may be regarded as a sort of
rk to Erhlungshan and Sungshushan.

se wall in rear of the line of detached forts
t of attack was considerably modified and
by the Russians during the progress of the
XXI shows profiles of the unmodified wall
modifications at several points. The bomb-
the banquette were practically continuous
shan to North Tungchikuanshan, and an ex-
f their construction is afforded by the plate
graph herewith.

East Panlungshan the wall makes a right-
which can be enfiladed from the front. This
raversed.

eaking, the three permanent works on the
by regular siege works were well planned
deficient as to bombproof cover and interior
. The forts were not completed as regards
arrangements noted may have been of a
acter.

of the inner defenses in the eastern sector
lainly shown on Plate XXXVII. These
ar to have been planned with an idea to
parts of the outer lines as might be taken
. For example, from Wangtai a line is
ungshushan battery retrenching forts Erh-
ngshushan. From Wangtai a line is also
south to connect with the inner enceinte,

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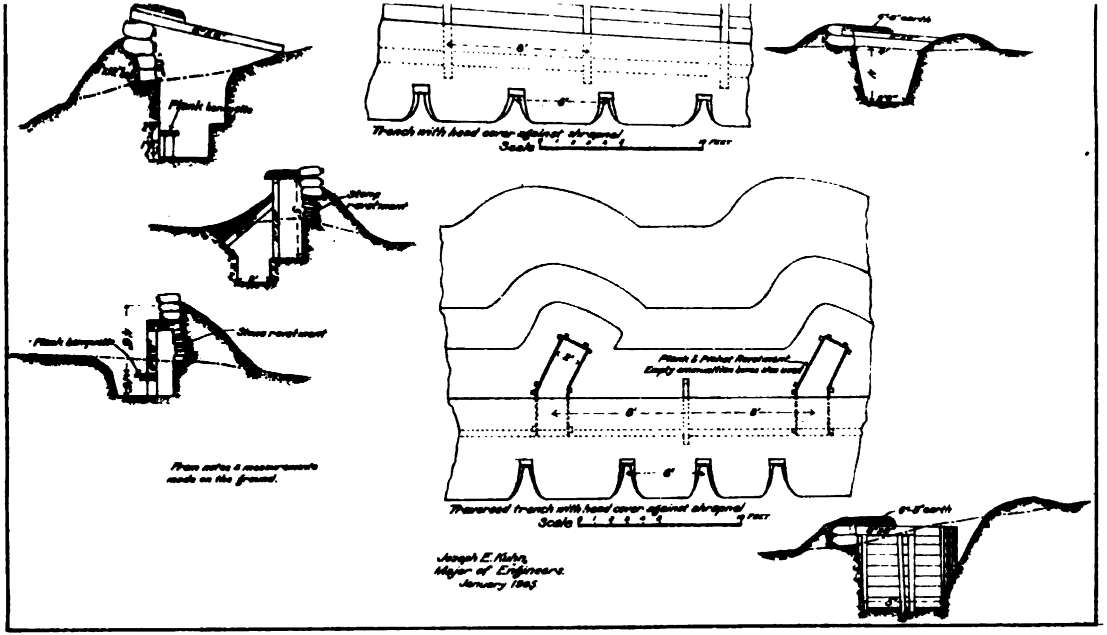
Plank banquette
Stony revetment
Plank banquette
Stone revetment
From notes & measurements made on the ground.
8'
6'
Trench with head cover against shrapnel
Scale 0 1 2 3 4 5 10 FEET
2'-6" earth
2'
Plank & Picket Revetment
Empty ammunition boxes also used
8'
8'
6'
Traversed trench with head cover against shrapnel
Scale 0 1 2 3 4 5 10 FEET
0'-8" earth
Joseph E. Kuhn,
Major of Engineers.
January 1905

PLATE XIX

STANFORD LIBRARIES

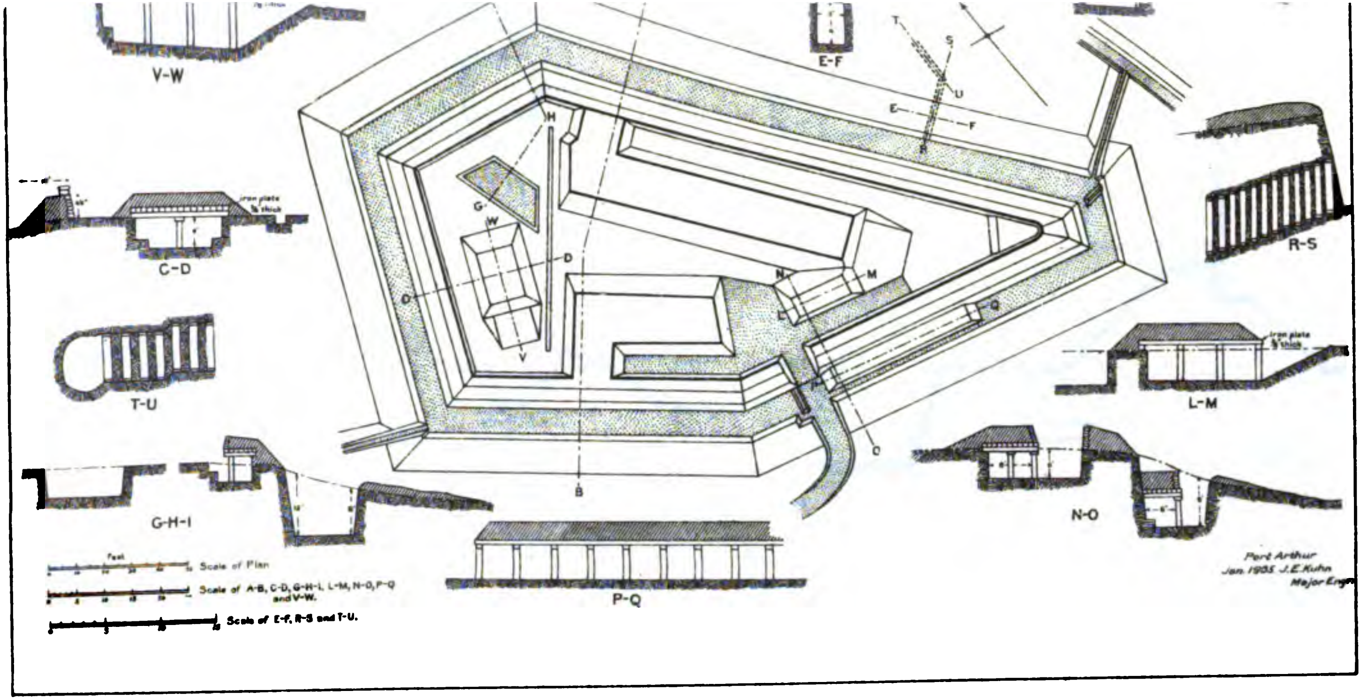
V-W
C-D
iron plate ⅝" thick
T-U
G-H-I
E-F
T
S
U
E
F
R-S
H
G
W
D
D
V
N
M
L
Q
P
O
B
L-M
iron plate ⅝" thick
N-O
P-Q
Feet
Scale of Plan
Scale of A-B, C-D, G-H-I, L-M, N-O, P-Q and V-W.
Scale of E-F, R-S and T-U.
Port Arthur
Jan. 1905 J.E. Kuhn
Major Engrs.

PLATE XX

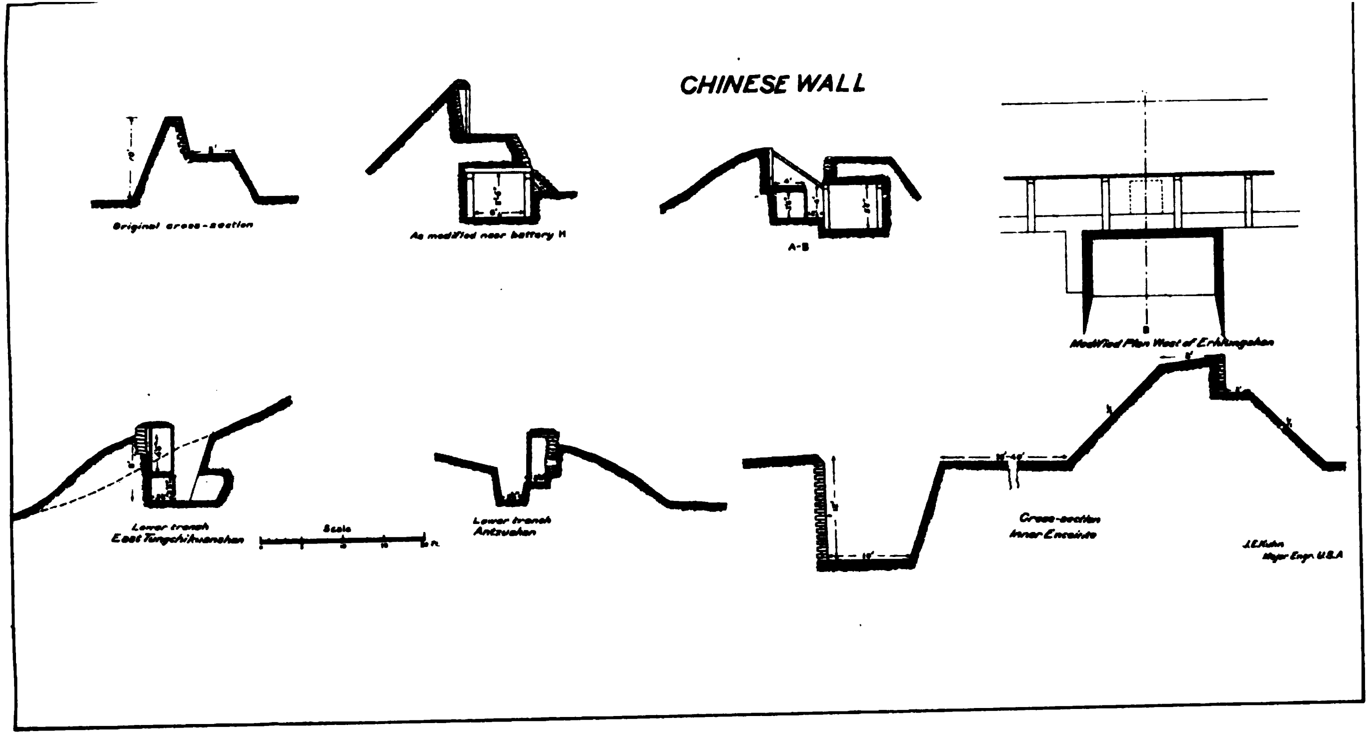
CHINESE WALL
Original cross-section
As modified near battery H
A-B
Modified Plan West of Erhlungshan
Lower trench
East Tungchikuanshan
Scale
0
5
10
15
20 ft.
Lower trench
Antzushan
Cross-section
Inner Enceinte
J. E. Kuhn
Major Engr. U.S.A.

PLATE XXI

Hsiaoantzushan
Concrete Battery

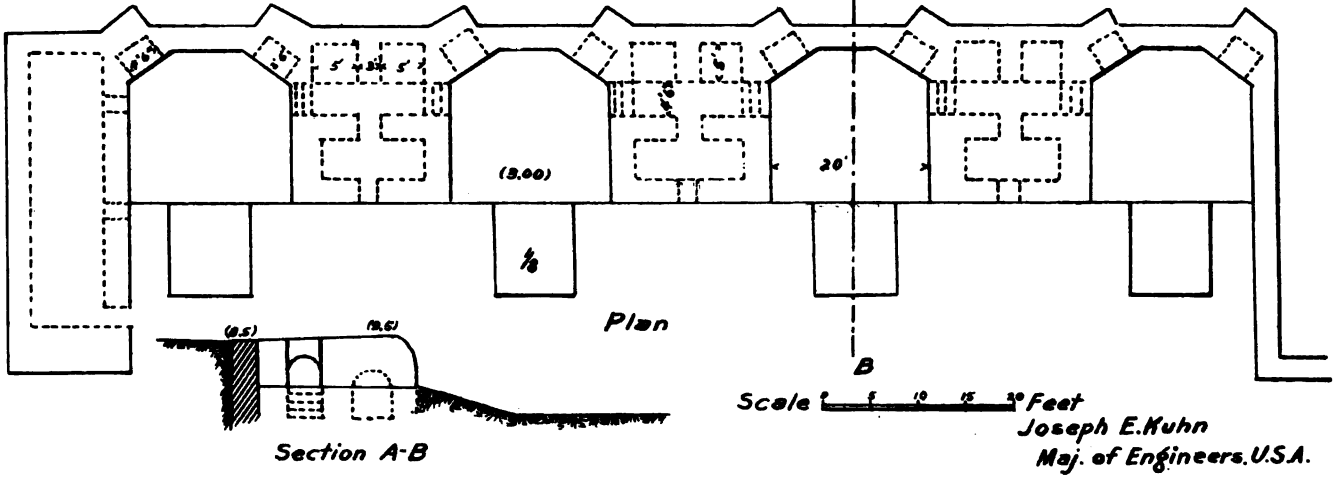

PLATE XXII

Taantzushan Fort

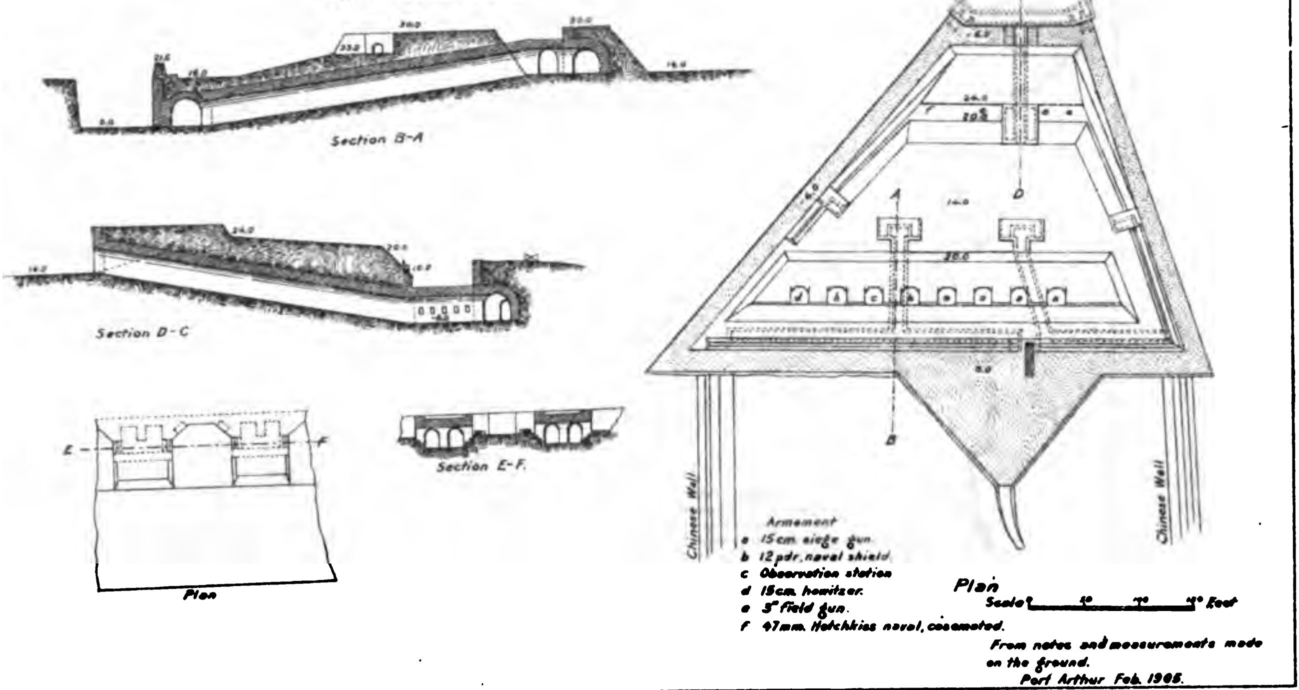

PLATE XXIII

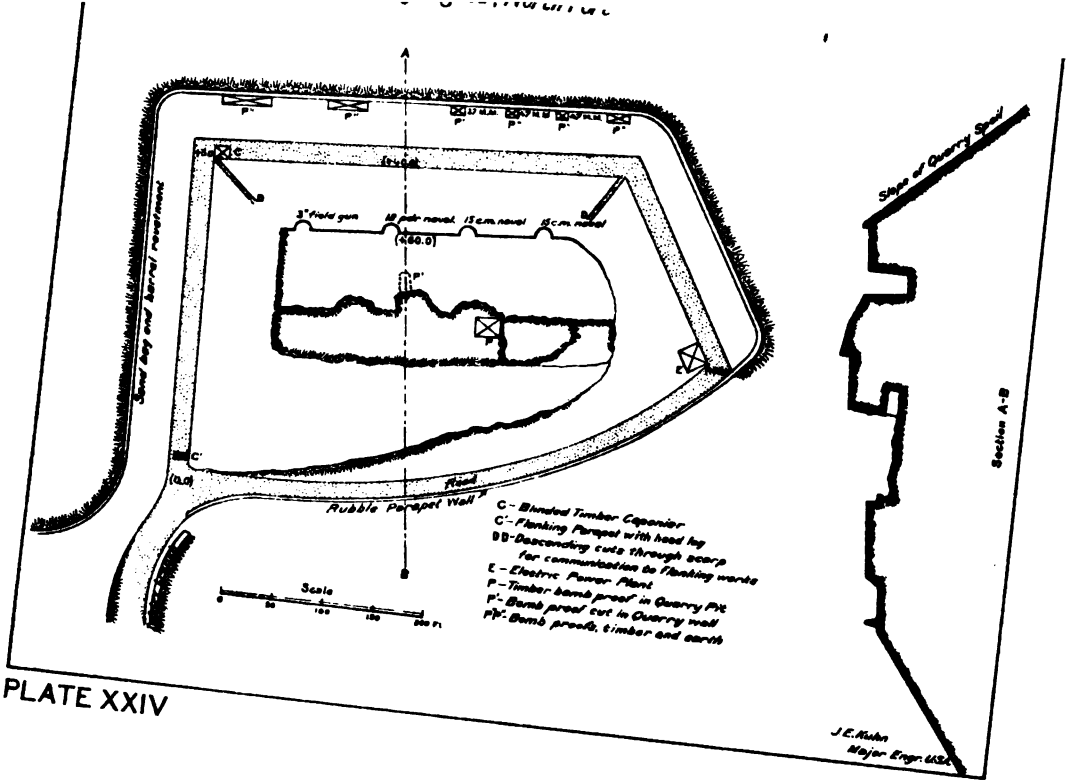
A
P''
P''
P' 37 M.M.
P' 47 M.M.
P' 47 M.M.
P'
C
(+40.0)
(+50.0)
D
D
3" field gun
18 pdr naval
15 c.m. naval
15 c.m. naval
(+60.0)
P'
P
E
Sand bag and barrel revetment
C'
(0.0)
Road
Rubble Parapet Wall
B
Scale
0
50
100
150
200 Ft.
C - Blinded Timber Caponier
C' - Flanking Parapet with head log
DD - Descending cuts through scarp
for communication to flanking works
E - Electric Power Plant
P - Timber bomb proof in Quarry Pit
P' - Bomb proof cut in Quarry wall
P'' - Bomb proofs, timber and earth
Slope of Quarry Spoil
Section A-B
J.E. Kuhn
Major Engr. U.S.A.

PLATE XXIV

ditch were one 3-inch field gun, one naval 12-pounder, two 15-cm. naval guns, of which latter one had been cked. The fort also contained a searchlight and an elec- power plant, destroyed by fire. The fort suffered heavily n the Japanese bombardment.

strong infantry trench runs south along Taiyangkou ge, terminating at the south end in a concrete battery aining six 15-cm. siege rifles on front pintle garrison iages. No. 4 gun had either been shot in two at the e or burst while firing. On the left of the concrete bat- was a 15-cm. long naval gun in an earth emplacement. concrete battery has a lookout on the right flank and a er advanced infantry trench. Photographic views of the yangkou Ridge taken from Fort Hsitaiyangkou are sub- ted herewith.

rom South Taiyangkou the line runs across the valley sep- ing Taiyangkou ridge from the knoll upon which lies Fort taiyangkou (Pl. XXV). The latter is a strong polygonal k with a salient gorge and ditches flanked by scarp and nterscarp galleries. The amount of masonry construction his fort exceeded that of any other fort in the Russian lines lefense. Besides the scarp and counterscarp galleries, there e four masonry bombproofs on the parade. All masonry k is of concrete. The armament in place consisted of al 12-pounders and 10.5-cm. siege rifles, as noted on the wings. It was noted that whitewashed stones in the fore- und were employed to furnish ranges to the Russian ners, range tables being posted up in the batteries. The y slope in front of the fort has been scarped at two places, ing vertical rock faces 12 to 15 feet high. The knoll n which the fort is located was surrounded by a con- ious infantry trench joined to the gorge of the fort. taiyangkou is the last permanent work in the Russian d line. It appears to have been beyond the range of the anese guns and bears no evidences of bombardment. The contains a 36-inch searchlight station and oil-engine er plant.

rom Hsitaiyangkou the Russian land lines run south and theast to the extremity of the Tiger's Tail Peninsula along ries of low knolls fronting the valley, beyond which lies Laotiehshan promontory, which terminates the Liao-

freely used on
permitting of their constr
On Laotiehshan promonto
1,000 feet, was at least one b
designed to fire on ships.
Laotiehshan, but the batte
station were visible fron
Arthur.

Beyond the inner line
an outer line which leav
and runs via Fort Itzush
and terminates on 20
Fort Itzushan (Pl. X
will be seen that the
adapted to the outlin
ated. Except at the
are no ditches, owing
entrances to the fo
gates. The arma
bombardment and
fort has an electri
the gorge wall.

The trenches i
Hill are shown
Hill these are
The upper tr
strength, bein
with plate i
fired through
ports in the
treme steep
sians a tre
was freely
liberally
war hea
rolled d

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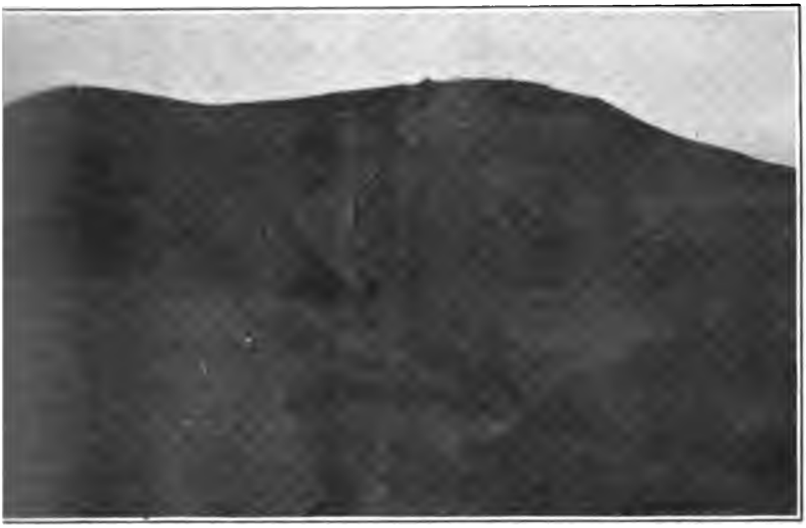

67. 203 METER HILL, FROM JAPANESE SIDE.

68. MANTOUSHAN, LOOKING SOUTH.

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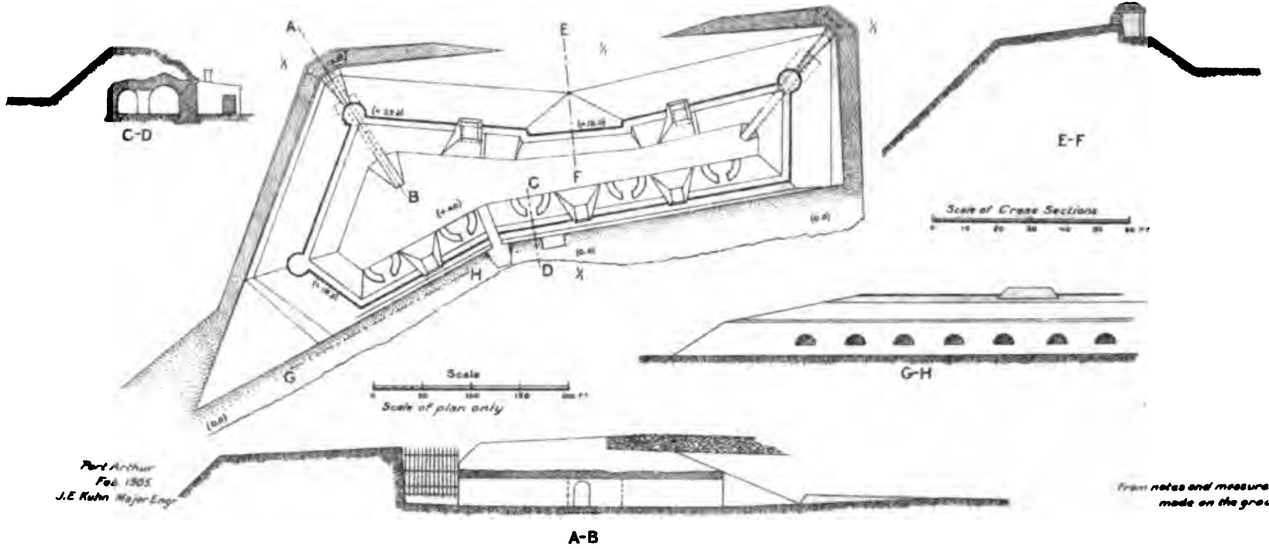
Itzushan Fort



Port Arthur
Feb. 1905
J.E Kuhn Major Engr

From notes and measurements
made on the ground

PLATE XXVI

STANFORD LIBRARIES

apanese at one time believed that the summit of the id been tunneled from front to rear to bring up re- under cover, but no evidences of such construction e found. It was not until the blinded trench above l to had been literally shot to pieces with artillery Japanese succeeded in taking the position. Speak- he final assault, a Russian merchant in Port Arthur d the report of the effective Japanese artillery fire ept the reverse slopes on that occasion and prevented ging up of reenforcements. He further stated that ans made several attempts to bring up reserves, even valescent and hospital attendants, but the attempts

pearance of 203-Meter Hill is shown by the photo- rewith.

SEACOAST DEFENSES.

coast batteries covered a front of over 5 miles, an equal frontage on either side of the harbor en- mmencing on the right flank of the Tiger's Tail y No. 102 (Pl. XXVII) is for five 15-cm. ns on pedestal mounts.

the left is a battery for eight 23-cm. howitzers, ur were mounted in line in the right half of with no traverses to separate the guns. The the battery is without armament. The two eparated by a 16-foot traverse, and each half ge of 130 feet. The guns fire over a 10-foot tted with stone in the lower portion and with the upper. On each flank of the battery is a and earth observation station sunk into the gun platforms are of timber and the racers vel. On the reverse slope behind the right gazine, old style, sunk into the slope, with an ll around the magazine chamber. The roof 2 feet of timber and 4 feet of earth. The is of an obsolete type, both as regards arma- truction, and is valueless in a modern fortifi-

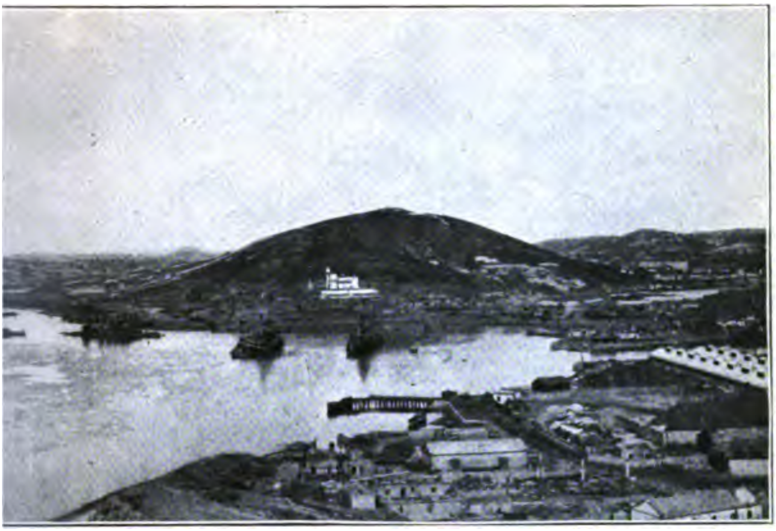
similar battery is No. 104, mounting four rs on F. P. carriages, the battery being in

two ha
and ma
8-foot l
dition.
thick. 12
Batteries
zers and fo
highest ridg
the Chinese.
struction. par
XXVII. which
battery presents
a handsome app
as a coast-defen
warrant such exp
crowned about 1 f
inch layer of aspha
from the gun pits
28-cm. howitzers wa
nion band.

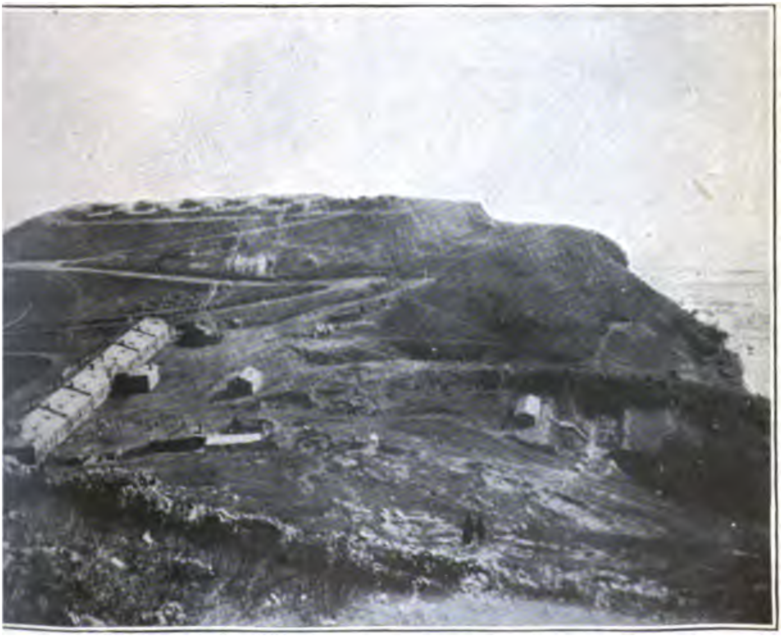
Battery No. 107 is
in all respects to batter
barely projects beyond
of the superior slope wa
These guns appear to
probably at the ships of t
attempted by Admiral To
were also observed to fire la
mounts permitting an all-aro

Farther to the left, behind
water's edge, is battery No.
rifles, mounted on C. P. garr
is of earth, with 14-foot trave
which are 22 feet wide. The gun
parapet. Only three guns were n
spection. The battery is a crude
modern system of fortifications.

To the left front of the last batter
are three 12-pounder naval mounts (o
emplacements of earth and sand bags



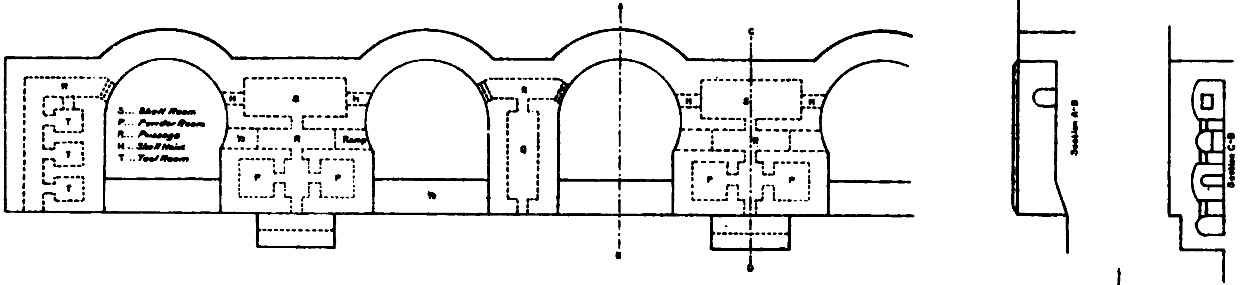
69. QUAIL HILL, FROM GOLDEN HILL.



70. ELECTRIC BATTERY.

STANFORD LIBRARIES

MANTOUSHAN HOWITZER BATTERIES 105 AND 106



TIGER'S TAIL BATTERIES 102 AND 107

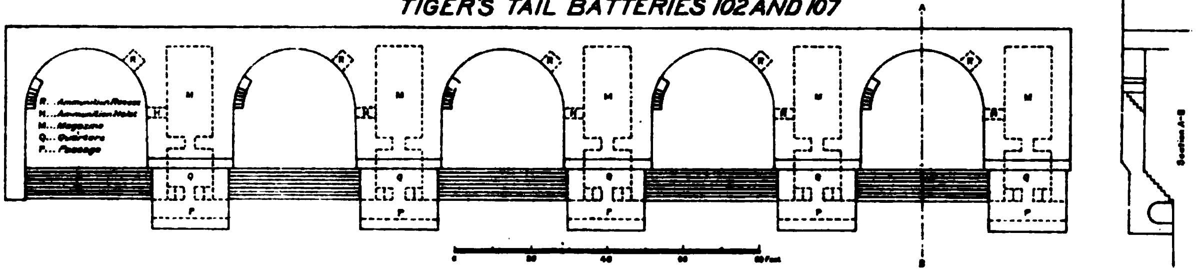


PLATE XXVII

STANFORD LIBRARIES

ır defense against a raid by torpedo boats and was placed for this purpose. On a steep little knoll ely behind the battery is a bombproof lookout staırently a signal station for ships. Three searchons and two power plants were located as shown XXXVII. The power plant behind battery No. :s of a portable boiler and engine with a six-pole dynamo, all of Russian manufacture. The plant tery No. 107 comprises portable boiler and engine manufacture with a belt-driven Siemens-Halske

ıow to the east side of the harbor entrance we) the Golden Hill mortar battery (No. 1), which summit of the hill which flanks the harbor enthe east. The battery provides emplacements n. howitzers and two rapid-fire guns on the left tter being vacant. The construction and gen- of the battery are shown on Plate XXVIII. ». 1 had been put hors de combat by a 12-cm. ·om 203-Meter Hill naval battery, but the reament was uninjured. The shell rooms of the provided with ceiling trolley ways made of ·s, thus ⌊ ⌋. The shell is transported to the leading to the floor of the pit and lowered onto which conveys the shell to the gun, where it is breech by block and tackle. This battery had damage from the Japanese naval battery on l, to which its rear is directly exposed at a) yards. The concrete of the battery was ented at a number of places, but no walls partial protection against this reverse fire, ·ses had been piled up at the rear of several Thirteen unexploded Japanese 28-cm. shells g in a pile on the ground in rear of the bat-·e apparently shells that had been fired at the ·hich lay close up to the slope of the hill in A careful inspection failed to reveal any ·y by 28-cm. mortars.

›lden Hill, on an advanced but lower knoll c Cliff, is the Electric Battery (Pl. XXIX)

mountin
placemen
right fla
zines an
ments co
platforms
steel hoo
hoisted fr
gun throu
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breech of the gu
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bottom of the fr
the tray the piv
outward to a ho
ward and forward
ramming into the
barded and was un

Battery No. 5, on
seacoast fort of rec
flanks and earthen f
works built in the U
placements for seven
by a 15-cm. siege gu
one by a 3-inch field

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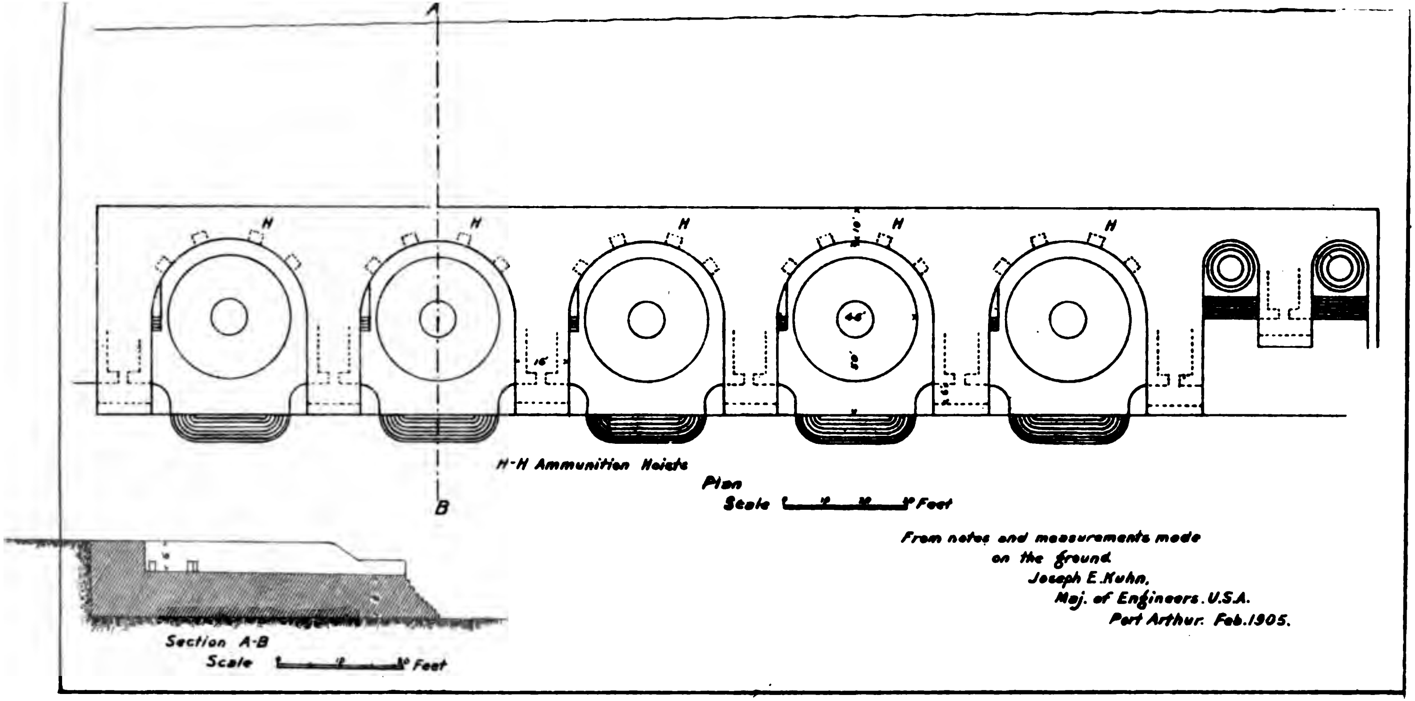

From notes and measurements made
on the ground.
Joseph E. Kuhn,
Maj. of Engineers. U.S.A.
Port Arthur. Feb. 1905.

PLATE XXIX

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ar of the old Chinese fort on the ridge is an old-style
attery, mounting eight 9-inch very short rifles of
pattern, bearing date of 1870, on front pintle seacoast
es with inclined chassis rail. The platforms were
er, very poorly built, and rough and uneven. The
ere located in pits about 35 feet wide, with 30-feet
es between, and fired over a 7-foot bank, revetted with
gs. A sunken road runs in rear of the battery, and
his road run two covered passageways to the reverse
where are located two magazines of Chinese origin
to those on the Tiger's Tail Peninsula. Farther
n the reverse slope is an electric plant, consisting of
ine and belt-driven dynamo.

her east on a high knoll is another old earthen bat-
o. 7, mounting four 23-cm. howitzers and one 10-inch
ower seacoast gun on Krupp center pintle carriage.
witzers were located in pairs in two pits, the 10-inch
cupying a third pit, with intervening traverses. At
ank of the battery was a sunken observation station
th and timber. The traverses and rear slope of the
ay in rear contained the ammunition recesses and
roofs. The 10-inch gun platform was of concrete and
of the howitzers of timber. The 10-inch gun fired
ard during the siege. Neither of the two foregoing
es showed any marks of bombardment.

ront of battery No. 7, on a lower knoll near the water's
s a new concrete battery, No. 8, for six 22-cm. howitzers
ter-pintle carriages and for two rapid-fire guns on
al mounts. As in other cases, the rapid-fire gun em-
nents were vacant. Plan and sections of this battery
own on Plate XXX, which will serve to explain its
uction sufficiently. Attention is invited to the double
f chambers under the traverses, the upper being used
ell room and the lower as a powder room. Behind the
flank traverse is a chamber utilized for an electric
consisting of a direct-coupled oil-engine plant made
oerting Brothers, near Hanover, Germany. The bat-
ppears to have been shelled heavily by the Japanese,
rous fragments of 15-cm. and 28-cm. shells lying about,
he concrete had suffered considerable damage at corners
dges. No. 4 gun had been dismounted by a shell, but

the remain
a shell lan
crete, and t
where a 15-
inches deep.
chamber fail
ing or scalin
more than 5
peared poor, s
der firing and

The line of s
This work conta
mounts. This ba
a concrete slab o
extending 37 feet
forward end of th
mark of the base o
to be still serviceab
and are located in
between. The traver
ing adjacent pits an
communication in rear
covered with timber
located under the para
magazine is sunk in th
covered passage from the
zine and emerging on
power plants and two sea
eastern sector of seacoast
XXXVII.

Battery No. 11 was for fi
similar generally to seaco
had evidently been comple
without armament. Althoug
ward, the battery construct
coast batteries for 15-cm. gun

The seacoast defenses of Po
a surprise, in view of all tha
their formidable character. W
tric battery, containing five hig

a single battery that merits serious consideration as
dable work. The 15-cm. (6-inch) guns, while good
in their way, were not even high power in the pres-
e of the word, none exceeding 35 calibers length. The
howitzers, of which there were ten all told, fire only a
nd shell and fall far short of the power of the 12-
ortars used in our own seacoast defenses.

drawings of the seacoast batteries submitted herewith
ade from pacing and estimation of the dimensions,
s careful notes as were possible under the circum-
While not absolutely correct as to dimensions,
re so essentially, and afford all necessary information
their character. An examination of these drawings
rve to show that in their general features the sea-
batteries at Port Arthur bear a striking resemblance
own. The chief points of difference lie in their
ely more simple arrangements and in the more lim-
se of masonry to secure cover both vertically and
ntally. In the Electric Battery there are 10 feet
ncrete in front of the guns, the greatest observed.
ther batteries had from 4 to 6 feet only. The maxi-
thickness of vertical cover noticed was under 6 feet,
imiting thickness appearing to be about 1½ meters.
sion for fire control, so far as were observable, appear
ve been limited to simple observation stations some
t square sunk in the parapets on the flanks of the
ries. These stations were of timber, with a light
ead cover of timber and earth, reenforced occasionally
late iron. The instruments seen through cracks in the
were apparently simple azimuth instruments. What-
the ultimate intentions of the Russians may have been
ding fire control installation, there certainly was no
nce of any of the complicated, elaborate, and expen-
system proposed by our Coast Artillery. The bat-
s were all open to the rear and were perfectly dry,
as the inspection was made in January and February,
e is no telling what their condition in this respect may
n summer.

EFFECTS

With regard to
there was a tot
bombardment by
Hill howitzer ba
noticed, and the
had been repaired
dently made a cra
or ship gun is un
all the seacoast ba
with the doubtful in

In view of the n
of Port Arthur by t
of the war, efforts
case from inhabitan
ments it appears th
bombard, but their
the harbor and the t
teries. This fire was
Tiger's Tail, but owin
and possibly also fro
Battery, the Japanese
from the west over La
habitants questioned
that the Electric Batte
was responsible for the
fleet; but in view of
Yashima by mines, it se
influenced more by the
ing his later bombardme

Apparently the Japan
the importance of preser
against the Russian flee
losses by serious bombar
decision was a wise one w

---

[a] A Japanese official report
cruisers Nisshin and Kasuga
and silenced same. The batt
bardment. A Japanese officia
the fleet from the shore batte
9, 1904.

ame time it can not but be regretted that the oppor-
presented for measuring the strength of ships against
as not put to the test. The effects of ships' fire on
seacoast batteries received no practical demonstration
Russo-Japanese war, and this much-vexed question
till continue to be a matter of uncertainty.

TER OF CONCRETE CONSTRUCTION AND ITS SUITABILITY AS A MATERIAL FOR BUILDING FORTS AND BATTERIES.

Russians employed concrete almost exclusively for
sonry work of their forts and batteries. It was largely
of rounded pebbles, and much of it was of indifferent
y, far inferior to what would be acceptable in the
States. The cement employed was of a Portland
n manufacture, and there is no reason to suppose that
uld not make a good concrete. Where damaged by
ry fire the concrete was frequently observed to be por-
nd friable, as if insufficiently compacted. Much of it
lso shelly and seamy, no pains having been taken to
a monolithic structure. No doubt the poor quality of
ncrete was largely due to the employment of unskilled
se labor in the construction of the defenses.

twithstanding the indifferent quality of the concrete, it
rs to have answered the purpose well when subjected
mbardment. Shells striking corners or edges naturally
ed out chunks of masonry, but there was not a single
nce of a magazine or chamber penetrated along the
e front. There was no evidence of the Russians having
oyed armored or reenforced concrete in any of their
s.

far as the results at Port Arthur go, concrete will con-
to be a most useful material in building forts and bat-
s, combining as it does economy and good resisting
ities.

RUSSIAN MAGAZINES.

om statements made by the inhabitants it appears that
tal of four magazines were destroyed during the bom-
lment, either directly by artillery or by conflagrations
ted in their vicinity. These were all old structures of
nese origin, located in the vicinity of the old town and
fficiently sheltered.

storage magazin
XXXVII, one c
and one in the c
These were buil
steep bank, and
Their roofs and
was ventilated l
The Russians e
securing reasona
sensibly built th
and air, depend
of these magazin

Owing to the
the defenses are
reach the differe
the eastern secto
upon which wer
sians have built
rocky hillside.
Antzushan fort
also been impro
was accessible l
heavy guns, am
these roads ma
The layout of th

The organiza
ployed by the J
given in the sub

Organization in ch
First Regiment Fortres
4 batteries..........
12-cm. bronze siege
itzers............
Second Regiment For
bronze mortars......
Third Regiment Fortre
1 battery............
10.5-cm. Krupp sieg
12-cm. bronze siege
mortars...........
Independent battalion,

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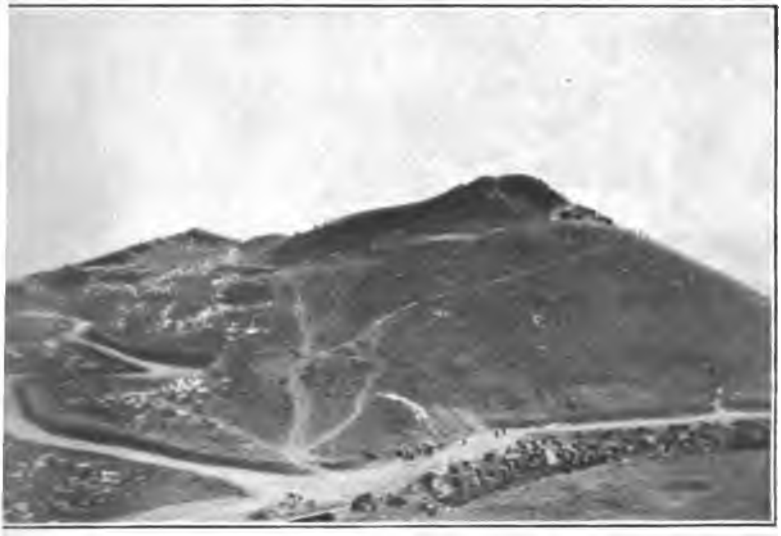
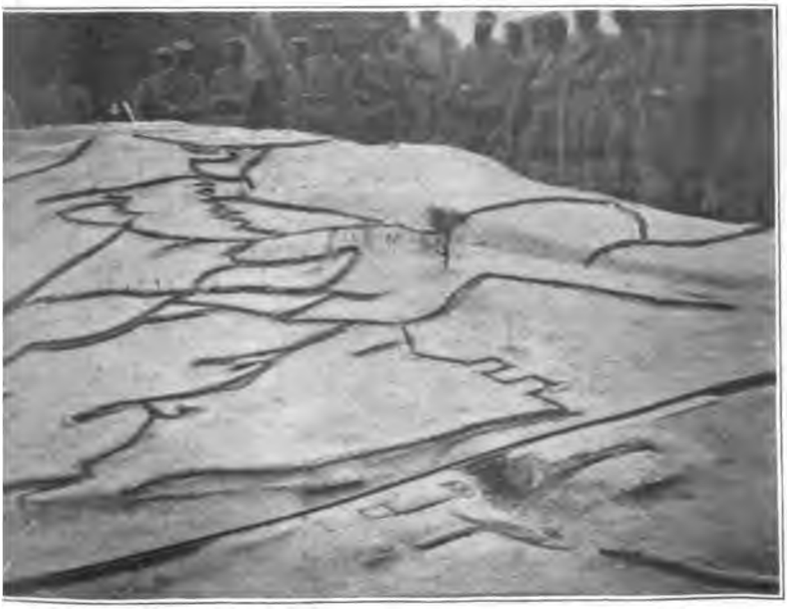


EAK (168 METER HILL), FROM SOUTHWEST, SHOWING TYPE OF RUSSIAN MILITARY ROADS.



72. MODEL OF SEIGE WORKS AGAINST ERHLUNGSHAN.

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nization in charge and designation of pieces.	Guns.	How-itzers.	Mortars.
ient groups:			
. howitzers	....	18	....
teries 12-cm. field howitzers[a]	....	28	....
illery brigade, 12 batteries field guns[b]	72	....	....
l artillery:			
nth Division, 2 mountain and 2 field batteries	24	....	....
h and Eleventh Divisions, mountain guns	72	....	....
Division, field guns	36	....	....
igade (four 15-cm., ten 12-cm., and eighteen 12-e)	32	....	....
tal	270	62	96

r howitzers knocked out and 7 batteries reorganized into 6 batteries.
ee batteries moved north Nov. 17, 1904.

ile this armament may appear formidable in numbers, of it was of low power and obsolete pattern, notably the 12-cm. bronze siege rifles and the twenty-four 9-cm. mortars. The small number of high-power guns and rge proportion of howitzers and mortars are specially orthy. The naval 15-cm. and 12-cm. and the Krupp m., aggregating twenty guns all told, comprised the en- rmament of direct-fire high-power siege guns. In other s, the Japanese relied mainly on indirect fire from heavy zers and mortars to search out the defenses located be- the natural cover so freely afforded by the hilly topog- y.

e disposition of the siege artillery is given on Plate XI. This plate gives the location of all the siege bat- , with changes made during the progress of the siege, the exception of one battery of two 12-cm. naval guns, h were fired in a casemated battery behind the crest some ards to the left rear of Battery E. This 12-cm. battery maintained in this retired position for about a month at eginning of the siege, firing at extreme ranges up to 0 yards by sinking the trail into a trench. The case- s in which this battery was placed had a roof of steel in contact with 6 inches of timber, 3 layers of sand bags, 3 feet of earth. The sides of the casemate consisted of 5 thicknesses of sand bags with loose earth outside. embrasure admitted of 40° horizontal fire.

ree kinds of projectiles were employed by the naval , armor-piercing, semiarmor-piercing, and common shell. explosive charges in the 12-cm. (4.7-inch) shell were as ws: Armor-piercing, 1.942 kilos picric acid; semiarmor-

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running into
The 28-cm.
in the harbor a

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Battery Q.
Tung
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piercing, 0.86
bursting charg

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evidently pou
this shell had

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weighs 5,310
shell weighs 2
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tically all the
mon cast-iron
noted among t
blinded shell
siderable numb
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The 6-inch
mounted on co

The 28-cm.
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iron washer set
the nut and g
withdrawn an
platform is ma
The different
by two circul
fifty-two bolts
two inclined c
gun rests by
rails are four
as to bearing o
A recoil buffe
recoil at 45° is
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running into b

The 28-cm.
in the harbor

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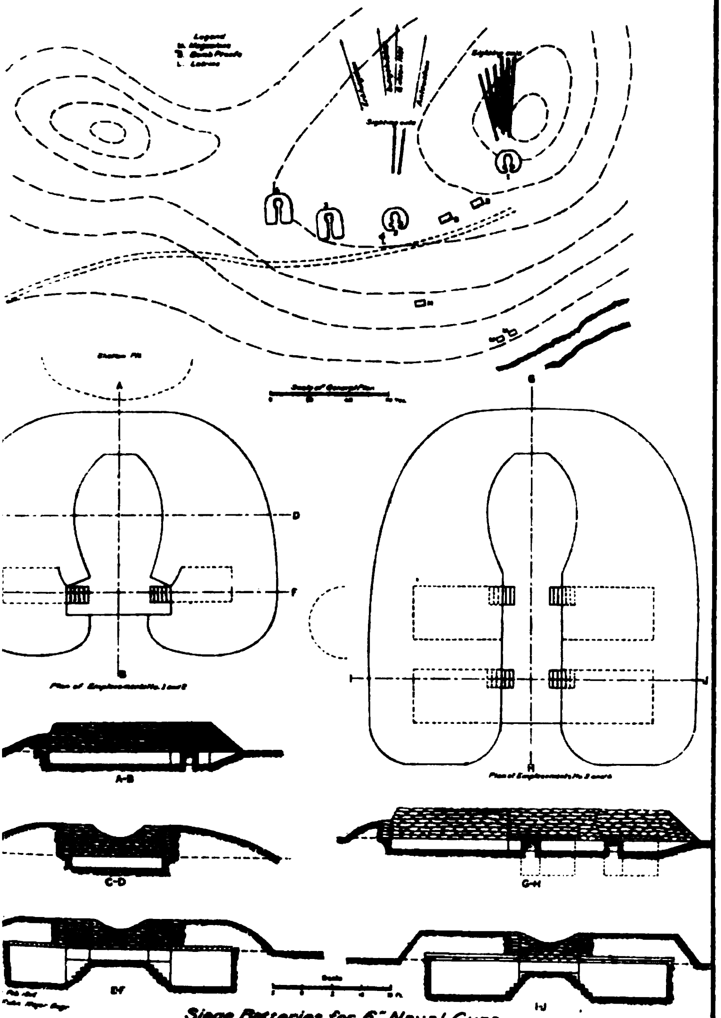

Siege Batteries for 6" Naval Guns
JAPANESE

TE XXXII

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the bombardment of the ships the average ranges were
ut 7,000 yards, and considering the character of the plat-
ns and the general inaccuracy of high-angle fire good
tice was made. Colonel Sato, chief of staff to the chief
iege artillery, stated that they averaged one hit in six
s on the ships after the occupation of 203-Meter Hill.
practice made in bombarding forts such as Erhlungshan
Sungshushan appeared remarkably accurate, the shells
ost invariably landing within the area of the fort.

o exact figures as to the number of rounds fired by the
m. howitzers were obtainable. Colonel Sato, however,
ed that an average of 800 rounds were fired by each
. In order to lessen erosion black powder was used
he propelling charge. The Japanese admit that the accu-
y of fire had been considerably affected by the erosion of
r heavy artillery.

he 15-cm. (6-inch) naval guns had combination timber
concrete platforms. The 12-cm. (4.7-inch) naval guns
e on wheeled mounts, the wheels being wholly of steel,
n angle-iron spokes. The heavy naval guns were em-
yed mainly for bombarding the town and ships and the
zushan and Taiyangkou forts in the western sector of
ense.

he construction of the 6-inch naval siege battery is shown
Plate XXXII. It will be noted that the emplacements
detached, Nos. I and II having long cuts in the summit
he ridge directed toward the different targets. Although
te exposed and the object of much firing on the part of
Russians, none of the guns were disabled by hostile fire.

he numerous 12-cm. and 15-cm. howitzers and mortars
e skillfully located in folds of the ground, ravines, and
ches which abound everywhere. They were moved from
e to time and on occasions to meet special situations, such
n assault upon a particular position. While lacking in
etrative power, the relatively heavy shell of the 12-cm.
d 15-cm. howitzers and mortars proved very effective in
rching out interiors of forts and batteries and the reverse
pes of positions.

The divisional field artillery was posted along the fronts
the respective divisions and was pushed well forward.
e mountain gun proved a specially useful weapon, as it

ployed from
its heavy she
cover and ha
tillery brigad
most skillfull
Nagata.

With refer
whose destruc
nese, this app
ing up the ha
Japanese line
had, but the g
from view.
fairly good
came possible
naval guns w
the extreme
Meter Hill a
Japanese fir
telephone, m
howitzers, as
were appare
official report
howitzers.
In the hasty
observable in
had landed.
be ascertain
water above
shot marks o
were torn an
naval action
bombardmen
sians had m
the fire of t
loose sheets
bags, but the
cant.

The appe

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d the expressed hope of the Japanese naval officers
they would be able to save at least several of them.
e then the salvage operations have resulted in the raising
very one of the six sunken war ships, and at last ac-
ts all but one had been taken to Japanese dockyards
e repaired.

ubsequent examinations in dry docks confirmed the sus-
on that the ships had been scuttled by the Russians
nselves and that they were not sunk by the fire of the
m. shells, as at first believed by the Japanese. It appears,
act, that very few shells even penetrated the armored
. As the shell was of common cast iron and had, more-
, a very sensitive fuse, such a result might have been ex-
ed. Finding the ships under an effective fire after the
pation of 203-Meter Hill, the Russians deliberately
tled their fleet, which had long since abandoned any
ntion of further operations on the high seas and had
n stripped of all its secondary armament for use in the
l defense. During the night preceding the capitulation
Russians mined their war ships in an effort to render
m wholly useless to the Japanese, but this work was
rly done, with the result that all have been saved.

esides the large war ships the harbor contained a large
nber of other vessels which were wrecked either by
illery fire or scuttled by the Russians, as follows:

boats (*Bobre* and *Gilyak*)	2
pedo-boat destroyers	2
pedo-boat catchers	2
vessel (sunk in entrance by Russians January 1–2)	1
ining ship	1
pital ship (*Angari*)	1
e-laying vessel (*Amur*, in dock)	1
dges	2
iliary gun vessel	1
rchant vessels (2 sunk at harbor entrance January 1–2; re- ainder belong to Chinese Eastern Railway and average 2,500 ns)	8
ating crane, 30 tons (sunk at entrance January 1–2	1

Two hospital ships, *Kayan* and *Mongolia*, were found un-
rmed and in use as hospitals, flying the Russian flag; also
e large dredge.

Before surrendering the Russians effectively blocked the

harbor entrance, leav
torpedo boats. Besid
shores of the entrance
miral Togo in his thr
Russian fleet. Incident
Japanese never succeed
although they made thr
ships, of about 2,000 tons

The effectiveness of the
siege is most noteworthy,
given for the skillful man
placed and handled. Person
study of the Russian works
this point. The ships, town,
dence of the terrible effective
fire. Practically all the Russia
knocked out and their artillery
of the Japanese guns.

Only partial data of the losse
artillery were obtainable. Of the
cupied the most exposed positions
fered heaviest, three 12-cm. and fi
were knocked out by the Russian
suffered 250 casualties out of a stre
known that four 12-cm. field guns a
were damaged. A number of the he
eroded by long-continued firing as to b
So far as the evidence obtainable goes t
the Japanese artillery suffered compa
considering the duration and character

The Russian artillery was about as ba
dled as possible. Placed in open batterie
most prominent and conspicuous hilltops
Russians were inviting the Japanese fire
their power. The batteries on Wangtai, r
and Ro. and the heavy guns in Sungshush
shan were most conspicuous and prominent
seen in the wrecks of guns and carriages in
batteries along the front of attack and on th
this front, which was a veritable graveyar
material. Bearing in mind that a gun of small

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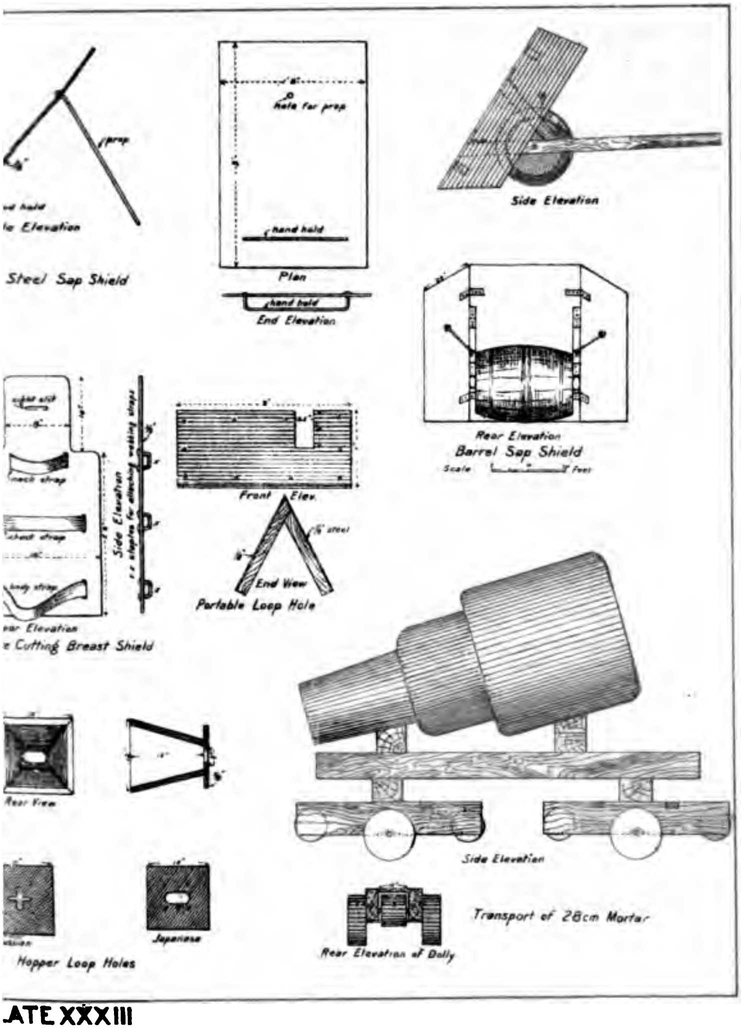
prop
hand hold
le Elevation
Steel Sap Shield
hole for prop
hand hold
Plan
hand hold
End Elevation
Side Elevation
Rear Elevation
Barrel Sap Shield
Scale
Feet
sight slit
neck strap
cheek strap
body strap
ear Elevation
Side Elevation
Front Elev.
End View
Portable Loop Hole
e Cutting Breast Shield
Rear View
Side Elevation
Hopper Loop Holes
Japanese
Transport of 28cm Mortar
Rear Elevation of Dolly

ATE XXXIII

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e a much larger one, the folly of placing fortress artillery open emplacements on conspicuous heights subjected to centrated fire becomes apparent.

SIEGE MATERIALS.

The country about Port Arthur is absolutely treeless and ords no timber or brush. Gabions and fascines were out the question, and sand bags were consequently used al- st exclusively by both sides to secure hasty cover. The ssian supply of sand bangs was exhausted before the end the siege, and the latest batteries and trenches thrown by them on the inner lines were revetted with sand bags de from any and all kinds of cloth that could be pro- red. Much of the cloth used was cotton print goods, giv- g to the parapets quite a gaudy and fantastic appearance. rrels, boxes, plank, and empty kerosene tins were also ployed by the Russians as materials for revetments.

The Russians had a good supply of timber and lumber owed in the city and were, moreover, fortunate in having l the resources of a large naval yard at their command. uch plate iron obtained from the naval establishment was ed by them in the construction of bombproofs, lookout ations, traverses, and loopholes. The Japanese profited by e occupation of Dalny, whose resources in timber, plate on, etc., were drawn upon to furnish them with material r blindages, sap shields, and loopholes.

The various from of sap shields, wire-cutting shields, and opholes are shown on Plate XXXIII. The lean-to sap shield as employed to secure temporary cover while placing sand ags or in starting a new section of trench. The barrel sap ield was used for similar purposes in the closer stages of the ttack. It is an exceedingly heavy affair, designed to cover ur men, and the Japanese admit that it did not work very ell, requiring too great an effort to move it on the steep opes. The wire-cutting breast shield was designed for se by the engineer troops when engaged in making openings rough the entanglements. It covers the head and body nly, but, as put by a Japanese officer, prevents a mortal ound if the man is careful.

In using this shield the neck and body straps are buckled

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tight between the
shield against the

The first form of
nese consists of tw
an angle of about
eighth inch sheet
inches, located as
struction. The id
form the bullet
Specimens of the
ently confirms this
gin of safety was
being all but penet
of loophole was su
iron plate five-eigh
used by both Rus
set in the sand-ba
struction. Many
plate covered by sa
ous. Many of the
heavily pitted by
sniping at short ra

The difference in
Russian and Japan

Scaling ladders
ing noted, one bein
a cedar spar with

Practically every
on military engine
defenses.

The principal lin
are shown on Pl
with a few except
and were conseque
been. They were
projecting about
ordinary galvaniz

uch heavier wire was used. Owing to the stony char-
r of the soil, the stakes could not always be driven firmly
the ground and were easily pulled out by the Japanese.
hevaux de frise had been erected where the railroad and
on road cross the line of defense and conformed strictly
ext-book construction.

eep military pits, each with its sharpened stake at the
om, were freely employed in the southwestern and south-
sector of the land line. The character of the soil pre-
ted their use at other points.

arge numbers of land mines had been planted at all
nts likely to be used as approaches by the attack.

hese consisted for the most part of wooden boxes, 24 by
y 16 inches, soaked in tar or asphalt to make them water-
of and filled with powder and made to fire automatically
means of the electric circuit closer shown on Plate
XIV. This circuit closer was attached in a vertical
ition to a board supported at the corners by light spiral
ings. When this board was stepped upon, the closer
uld tip, and the ball, coming in contact with the metal
g inside the closer box, would close an electric circuit.
ld stories of frightful losses by mines appeared from time
time in the press during the continuance of the siege, for
ich no foundation could be found. The Japanese them-
ves deny that they suffered any noteworthy loss from Rus-
n land mines. That some mines were set off and some
v casualties incurred is, however, certain.

Beyond the outer line of wire entanglements from Paiyin-
an, old fort, past Sungshusan, and across the valley past
e slopes of Itzushan the Russians constructed an elec-
ically charged wire, supported by stout stakes some 20
ches high carrying common porcelain insulators on top.
his wire was doubled and trebled in places and appears to
ve been charged by the electric plant behind the Chinese
all on the right of Erhlungshan. It is understood that one
panese soldier who had ignorantly come in contact with
is wire received a shock. No other evidence of damage
as forthcoming and it must be assumed that the wire was
failure. The difficulty of securing insulation with a bare
ire so near the ground and the ease with which such a wire

exp
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On t
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forms obs
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iron shells;
edges bent o
H are differen
fused dynamit

All these are
"firecrackers,"
in commercial m
punk and the gre

F represents a
grenade made by
case is soldered on
case. The fuse has
rifle cartridge case
the side of the rap
friction primer is ins
base of the rifle cartric

The Russians also use
sene with a small bursti
not be learned whether
in view of the small an
the saps and parallels it p
The Japanese also attemp
hand force pump to spray
and then hurling burning bu
in oil.

Bomb guns for throwing g
than was possible by hand we
Japanese at first employed a
hooped with bamboo and suppo

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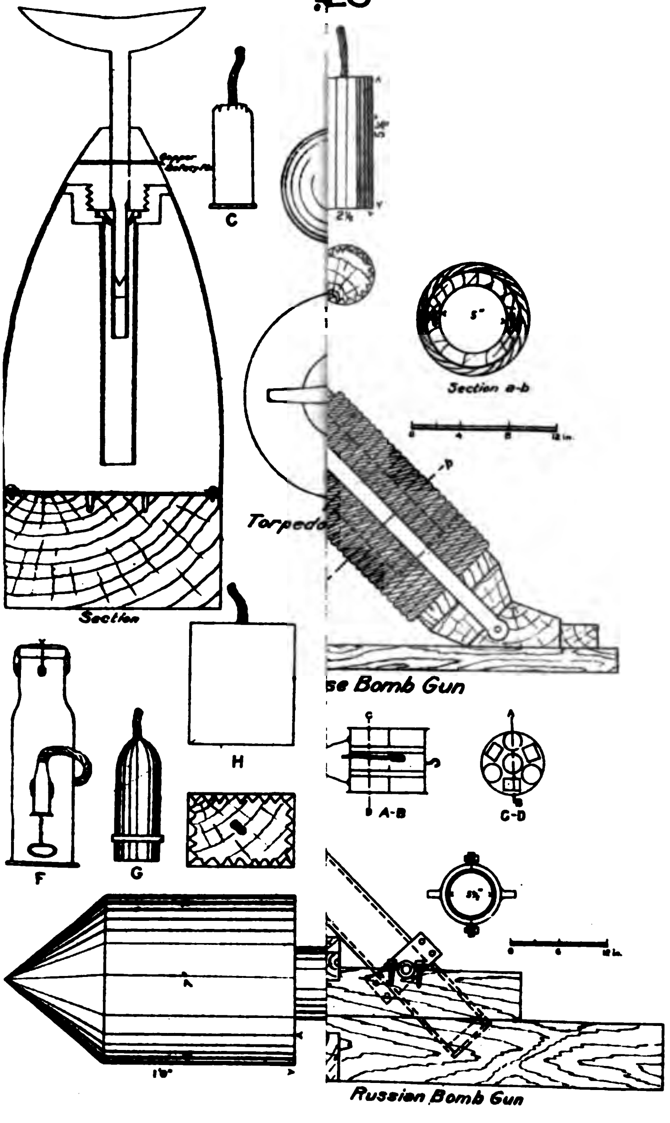
RUSS
ES



TE XXXIV

explosive, mounted
to 40 feet long, by
forward from the tre
or work. When in
electricity.

On the part of the
were much more exte
cartridge cases, tin ca
gun cotton or bags of c
employed. On Plate
forms observed are dr
without detailed descri
iron shells; C, a 37-mm
edges bent over a woode
H are different forms of
fused dynamite cartridge

All these are, in effect
"firecrackers," the fuse
in commercial mining and
punk and the grenade the

F represents a somewh
grenade made by the Ru
case is soldered on the o
case. The fuse has one e
rifle cartridge case and th
the side of the rapid-fire
friction primer is inserted
base of the rifle cartridge ca

The Russians also used an
sene with a small bursting c
not be learned whether this
in view of the small amoun
the saps and parallels it proba
The Japanese also attempted
hand force pump to spray the
and then hurling burning bund
in oil.

Bomb guns for throwing gre
than was possible by hand were
Japanese at first employed a 5
hooped with bamboo and support

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Plate XXXIV. The grenade was an ordinary tin can, h a hook at one end for lowering and a small bag of k powder wired on the other end. The mortar was ays set at an angle of 45°, and the range varied by the pelling charge, which may be from 20 to 80 grams. maximum range attainable is 400 meters. Later in siege the Japanese made a 7-inch wooden bomb gun, ilar in all respects to the 5-inch gun. Many of these b guns were employed by the Japanese, and their ad-ced trenches were full of them. The gun simply rests ts frame and is so light that it is easily carried by one and the frame by another.

he Russian bomb gun, of which but a single example found, is made of wrought-iron tubing 5½ inches in-al diameter, and provided with trunnions. It is shown Plate XXXIV.

he Russians also employed torpedo war heads arranged ire by percussion and propelled by a light charge from rpedo tube. A number of these were discharged at the panese in the earlier assaults of 203-Meter Hill.

he latest development of hand grenade made by the panese is shown on Plate XXXIV. This was not used at t Arthur, but developed subsequently for use in the field. inventor is stated to be the chief engineer of the Second ny. This grenade consists of a tin cylinder about 6 inches g and $1\frac{5}{16}$ inches diameter, closed at both ends, the tom diaphragm being about 1 inch from the lower end of tube. The upper diaphragm has a tin tube which pro-s into the interior of the grenade and of a size to easily nit the copper primer. A double ring of lead, nicked at ht points, surrounds the grenade near its upper end, its ect being to provide fragments when the grenade explodes. in cup, containing lead to give it weight and carrying an inary wire nail, is slipped over the upper end of the gre-le, a groove in the side engaging a projecting copper wire, ich is soldered transversely of the grenade and bent at the ddle so as to clear the primer tube. When the cap has n pushed down as far as the groove in its side permits, point of the wire nail is just clear of the fulminate in primer. By turning the cap in either direction the

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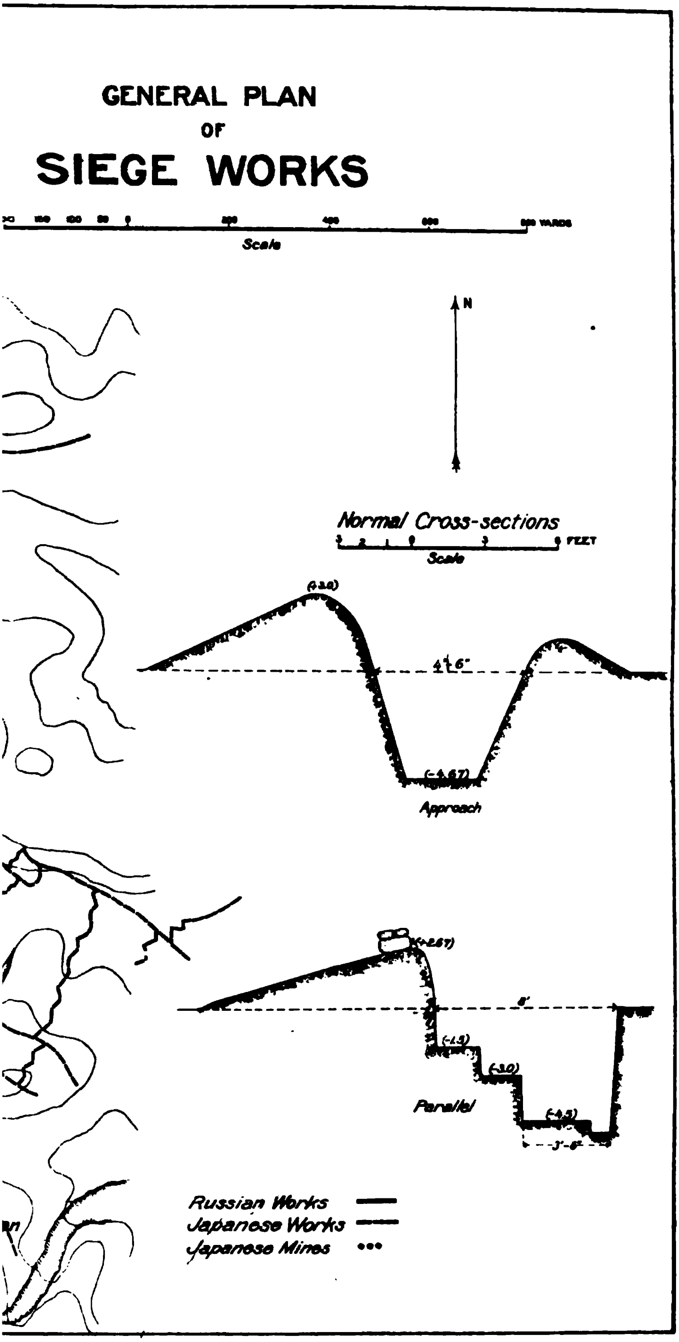
grenade may be made
the details of the groov
a metal cut-out. By
soldered to the cap the
tion while being carr
safety strip and turning
in the firing position, a
ing the grenade safe.
wire ring to which are
holes in the side and ha
tape some 3 feet long.
away in the cavity at th
use. A doubled galvan
of the grenade enables
belts when going into
three springs made of
the grenade, while the
falling out of its tubes
bent down after the pr

The primers are carr
who issue them to the
using them. The caps
caps replaced to the s
use the caps are placed
at the base opened out
and forward several t
The weighted head and
grenade head on. On
through the small strip
the latter to be driven
point is covered with
minate of the primer
grenades were made an
during July and Augu
satisfactory. They we
tained locally, the prin
from the spoils at Port

The part played b
was so important that
future wars merits se
fect is intensely local, th

GENERAL PLAN
OF
SIEGE WORKS



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; were used with telling effect against the Japanese in numerous bloody assaults, being trained to cover all ıpproaches with a murderous fire.

EFFECTIVENESS OF THE JAPANESE BLOCKADE.

ıe Japanese blockade appears to have been very effective. ·rding to statements of the inhabitants but three small ıers managed to elude the Japanese fleet, each bringing cargo of flour. Intercourse with Chefoo by Chinese ; landing in Pigeon Bay was so precarious and uncertain have been an almost negligible factor. On the land of course, all communication with the outside world ɔarred as the Japanese lines extended from sea to sea.

SIEGE WORKS AND SIEGE METHODS.

·omprehensive plan of the Japanese siege works, showing aps, parallels, and mines, appears in Plate XXXV, normal cross sections of approaches and parallels. ; lines were all verified upon the ground and are es- .lly correct.

; bulk of the sapping was effected by the flying method, sand bags instead of gabions. Most of the work was at night, following the orthodox methods prescribed e conduct of sieges. Considerable ground was also l by the costly but more expeditious method of assault, ly in the October assault, in which the Japanese seized l advanced trenches of the Russians and utilized them ·allels while constructing approaches to the rear. The ·ous nullahs running in front of the Russian works ı the intervals between readily lent themselves to the of the Japanese and were freely used both as parallels pproaches, but chiefly the latter. A common method lizing existing nullahs as approaches was to defilade by sand bags placed on planks or timbers thrown the top of the nullah. This may be clearly seen in ew of a most excellent model constructed in August eptember, 1905, by the Ninth Engineer Battalion at ·hiatzu, near Chinchiatun. This model was con- ·d in clay on a scale of 1:100, and was a faithful por- of the siege works in the front of the Ninth Division ing from Erhlungshan to P fort, inclusive. The total

development of siege works as
officer of General Nogi's army
parallels, 18,906 meters approa
to headquarters, and 682 meter
25 miles of siege trenches.

The Ninth Division, which
the front of attack than the r
structed the following: 5,478
approaches, 3,552 meters hea
meters mine galleries.

Except on the steep slope
forts the soil was easily dug.
the ground was practically
which could be picked out
seams. The mine shafts an
chikuanshan, Erhlungshan,
solid rock and required no li
Chinese wall from the two
being in earth.

The sapping operations i
only involved the following
201 infantry; wounded, 44

The battalion command
that only 14 or 15 soldiers
of the Ninth Division from
departed from Japan.

The average daily loss
fifteen to twenty per day
under construction. An
chief engineer, is authori
gate losses by sapping,
2,000 men.

The mining operation
usual features. The loc
sions of resulting craters
XXXVI. Five gallerie
pet and charges aggreg
der," or picric acid, we
shan, two mine gallerie
about 14,000 pounds of
The crater of Sungsh

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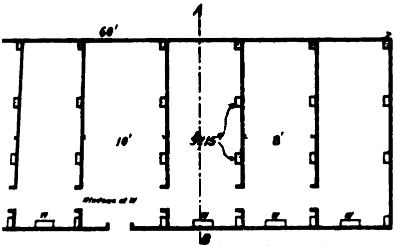
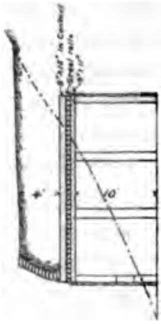
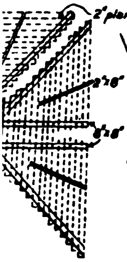


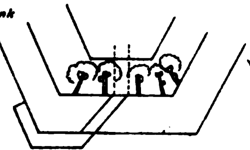
Russian Bomb Proof Winter Barrack



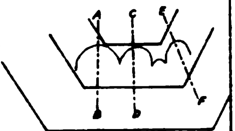
Section A-B



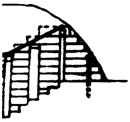
g



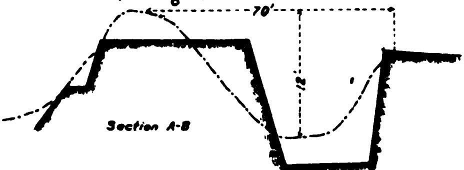
Location of Mines, Ehhlungshan



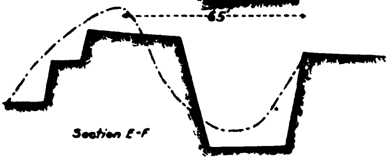
Plan of Craters



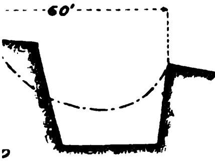
g Station



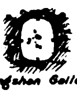
Section A-B



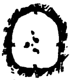
Section E-F



D



Erhlungshan Galleries Soft Rock



Section Japanese Gallery, between E & W Panlung. Firm Earth

ameter and 127 feet deep on the axis. The form and ions of cross section employed in some of the mine s are also shown on Plate XXXVI. The Japanese ed their galleries largely by chisels and picks, but l also to light blasts.

Russians do not appear to have engaged in counter- very actively. At North Tungchikuanshan they fired rmine, breaking in the Japanese gallery of approach, did more harm than good, as the Japanese promptly the Russian gallery. At Erhlungshan a countermine rogress, and from prisoners it was learned that the had expected to complete and fire the same four r the Japanese blew up the parapet. A number of ntermines or camouflets were also reported to have l by the Russians, but appeared to have been barren results. The Japanese employed dummy men to fire of the Russians, while the latter, in at least two had mounted dummy guns to deceive the Japanese

RUSSIAN BOMBPROOFS AND OBSERVING STATIONS.

us bombproofs were constructed by the Russians Chinese wall and on the reverse slopes of the hills front of attack. In none of these did the vertical nber and earth exceed 5 feet—an insufficient cover 28-cm. shell, as was shown by several covers which enetrated. On the reverse slope of Battery M a of the type under construction had evidently been he closing days of the siege and its occupants toms, their remains still lying about when the s first inspected. A large bombproof barracks, finished, is shown on Plate XXXVI. The sole feature of the bombproofs was the occasional te iron above the roof timbers. Where applica- struction is believed to be advantageous in offer- d resistance to the penetration of a projectile superincumbent layer of earth.

out stations or observatories were built by both generally took the form of a bombproof cham- et square, with a horizontal slit for sighting. ally strong observation station, built by the

Russians in an exposed position on the front slope below batteries No. 56, was built of steel rails, concrete, brick, and earth.

Another form of observation station noted on height near battery No. 94 (Pl. XXXVII) is shown on Plate XXXVI. This is built wholly of earth and timber and affords a field of view extending through 225° of arc.

The numerous gullies along the front afforded excellent sheltered camps for the Japanese troops where they built their little huts, using odds and ends of timbers, planks, and mattings, to make them weather tight. By digging and banking up, and using shelter tents or straw matting as a roof they made themselves snug and cozy. Even in the advanced saps, cubby-holes or recesses were excavated in the reverse slopes, and here the guards of the trenches made themselves comfortable with the inevitable fire box, teakettles, and their blankets spread on the ground.

In the rearward camps many of the troops had accumlated considerable flocks of poultry, chickens, and ducks, from which they derived a supply of fresh eggs. Fresh fish was frequently issued, being obtained from the Chinamen in and about Dalny. In short, when not on duty in the trenches, the Japanese soldiers took life quite easily, there being no marching and his food coming regularly and abundantly.

In anticipation of bitter cold weather a number of winter camps were laid out and built on the north slopes of the ridge occupied by the Japanese artillery line. These camps were for the accommodation of a battalion each and consisted of dugouts covered over by canvass or matting. Owing to the mild winter and the unexpectedly early termination of the siege these winter camps were never occupied, the soldiers continuing to live in the nullahs and ravines nearer the front until the end of the siege and their departure for the north.

LOSSES.

Some difficulty is experienced in reaching a reliable conclusion as to the losses experienced by the Japanese during the siege, no separate official figures being available. In a tabulated statement, furnished at my request by the chief medical officer of the Third Army, the number of killed and wounded, including the battle of Mukden, is put at 76,586.

isses at Mukden were stated by a staff officer after the to be about 18,000, which would call for about 56,500 siege of Port Arthur.

tly after the capitulation a staff officer reported the n killed and wounded from August 1 to the end of ge as 39,158. To this must be added the losses at n, officially reported at 4,204, and the losses at Kensan tzuling. Informal statements by the chief medical however, indicate that the losses were somewhat he having said that the aggregate losses in killed and l for the entire Third Army at Port Arthur were ,000. Weighing all the evidence attainable, I should the Japanese losses in killed and wounded at Port it not less than 60,000.

ief medical officer is authority for the statement that iber the percentages of wounds for those treated in itals were as follows: Bullets, 72 + per cent; artil- per cent; all others, 6.5 per cent.

al tabulated statement of losses for the entire war rd Army gives the following percentages for dead ded:

	Per cent.
	59.44
	19.63
	.69
s (including grenades)	12.13
	8.11

tively small percentage of bullet wounds in the y in this war is noteworthy and bears testimony iveness of the artillery and grenades in the siege thur.

issian losses little definite could be learned. The estimated the number of killed at 10,000, but as returns appear to have been rendered it is more hat the casualties in killed were more numerous. sick and wounded were in hospital at the date of of whom about one-third were wounded. Many stated to have been wounded several times.

COMPOSITION OF THE BESIEGING ARMY.

n chief. General Baron Nogi.

. General Idichi.

ision.—Generals Tsuchiya and Samejima; chiefs of staff, Colonels Ishida and Saito; Twenty-second Brigade, General Kamio: Forty-third Regiment, Twelfth Regiment; Tenth Brigade, General Yamanaka: Forty-fourth Regiment, Twenty-second Regiment; 6 batteries mountain guns.

Ninth Division.—General Oshima II; chief of staff, Colonel Adachi: Sixth Brigade, General Ichinobe: Seventh Regiment, Thirty-fifth Regiment; Eighteenth Brigade, Generals Mayeta and Hirasa: Nineteenth Regiment, Thirty-sixth Regiment; 6 batteries mountain guns.

First Division.—General Matsumura; chief of staff, Colonel Yoshio: Second Brigade, General Nakamura: Second Regiment, Third Regiment; First Brigade, Generals Yamamoto and Baba: First Regiment, Fifteenth Regiment; 6 field batteries.

Seventh Division.—General Baron Oseko: chief of staff, Colonel Ishigomo; Thirteenth Brigade, General Yoshido: Twenty-fifth Regiment, Twenty-sixth Regiment; Fourteenth Brigade, General Saito, Twenty-seventh Regiment, Twenty-eighth Regiment; 2 batteries field and 2 batteries mountain guns.

First Kobi Brigade, General Oki: First Regiment Kobi, two battalions; Fifteenth Regiment Kobi, two battalions: Sixteenth Regiment Kobi, two battalions.

Fourth Kobi Brigade, General Yakanachi: Eighth Regiment Kobi, two battalions; Ninth Regiment Kobi, two battalions; Thirty-eighth Regiment Kobi, two battalions.

Artillery brigade, 72 field guns under General Nagata.

Naval brigade, 1,200 men, under Commander (now Captain) Kuroi.

Three regiments, plus one battalion, plus two independent groups of fortress artillery, under command of General Teshima.

All the divisions were complete with engineers, sanitary, and train services.

Besides the troops enumerated the Seventeenth Regiment of the Eighth Division assisted in the final assaults on 203-Meter Hill. It is believed that this regiment remained behind at Chinchou when the Eighth Division landed in October, 1904. It departed for the north after the capture of 203-Meter Hill.

At its maximum the besieging army numbered fully 50,000 combatants, and with noncombatants fully 100,000 men.

Mention was also made of the Ninth Kobi Brigade, which appears to have accompanied the besieging army at the outset, but which was later sent to the rear. This brigade is reported as having behaved in an unsatisfactory manner during the August assaults and as having been in disgrace

SPOILS OF WAR.

nong the principal spoils of war, as officially published, he following:

ners (including 15,307 sick and wounded and 1,398 oled)		41,641
	pounds	1,460,250
d barley	do	132,000
meal	do	15,100
	do	2,322
it	do	990,000
d beef	do	87,750
s		1,920
fodder (sufficient for 56 days).		
of various descriptions		528
. (45-caliber) (electric battery)		5
. (34-caliber)		1
. (20-caliber)		12
. quick-firing naval		30
. (22-caliber)		16
. quick-firing naval		5
m. (20-caliber)		4
. quick-firing naval (12-pounder)		51
n. naval and casemate		28
n. naval		52
. howitzers		10
. howitzers		22

l the foregoing have fixed mountings. The following movable mounts:

. (21-caliber) cannon	14
. (15-caliber) howitzers	15
m. (35-caliber)	12
m. (20-caliber)	13
n. field, various	63
n. field, various	60
n. quick-firing Krupp	7
n. naval	10

mmunition for various kinds of ordnance:

	Rounds.
. howitzers	47
. rifles	130
. rifles	34
. rifles	136
. (25-caliber)	719
. naval	2,741
. howitzers	267

	Rounds
[illegible] naval	[illegible]
[illegible]	1,[illegible]
[illegible] field	13,4[illegible]
[illegible] field	46,[illegible]
[illegible] and [illegible]	109,[illegible]
Infantry rifle	5,496,[illegible]

An examination of the foregoing table shows that while the ammunition for the heaviest gun was pretty low, there was still a considerable quantity of ammunition for the medium and small caliber artillery, as well as for the infantry rifle. The provisions on hand, such as they were, would have sufficed the garrison for at least a month longer. That the pinch of hunger had not yet been felt by the garrison was evident from the chunks of black and brown bread found thrown away all along the Russian trenches. There also appears to have been an abundance of drink, for the ground about the trenches and the bombproofs were littered with vodka, rum, and wine bottles. A prominent merchant stated that, so far as drink was concerned, the town was so well stocked it could have held out for another year.

In view of the showing made by the above tables, the question of what would have happened had the Russians resisted à l'outrance suggests most interesting possibilities. Had the battle of Mukden been delayed two weeks it could not have been fought on the marshy terrain of the Mukden plain. On the 10th of March the ground was still frozen hard and the passage of rivers practicable at all points. Riding over the fronts of operations of the Fourth, Second, and Third Armies between the 23d and 26th, I found the rivers ice free and the ground to the west of Mukden so soft and boggy that it was difficult to move about on horseback.

Without General Nogi's army it would have been impossible to dislodge General Kuropatkin from his strong position before Mukden, and even with the army it is extremely doubtful whether the Japanese could have won their success at any other time than in winter. In my judgment it is not too much to say that the entire fate of the Mukden campaign was intimately connected with the period of the fall of Port Arthur.

As to whether General Stoessel could have prolonged his defense, it need only be pointed out that 25,000 effectives

d out of the fortress within a week after its capitula-
d that the supplies of food and ammunition were far
ing exhausted. While the civil population was en-
r duty, it appears to have been employed solely as a
orce and for manufacturing ammunition and gre-
The lack of intrenching tools appears to have been
t serious, as many picks were found worn down
o the helves. All the evidence attainable goes to
t the defense, while stubborn, was lacking in re-
ness and enterprise. The early death of Admiral
and later that of General Kondratchenko were seri-
s to the Russian cause, as both had demonstrated
s to be men of energy and resourcefulness. Fric-
reported to have existed between General Stoessel,
nor, and General Smionov, commander of the de-
ich did not help matters.

h Port Arthur had ultimately to surrender, as will
with any fortress, it yet paid for itself many times
eutralizing for five months an entire Japanese
the entire Japanese fleet, which had to do guard
g as the Russian Port Arthur Squadron was in
e time thus gained proved invaluable to the Rus-
nabled them to gather their forces and to with-
apanese advance in the north. Had the defense
ress been conducted a little more energetically,
ults might have been materially different, as has
n pointed out. That Port Arthur proved a
bling block in the prearranged plans of the
ms certain, and there is no doubt that they had
educing the fortress much earlier. Even before
e from Japan, in July, 1904, the public antici-
ll of the fortress daily and confidently to such
t festivities to celebrate the event had been ar-
ckets placed on sale.

JAPANESE ARMY IN THE BATTLE OF MUKDEN.

OPERATIONS.

y 26 the Ninth Division was at Tafanshin, the
sion at Huangniwa, the First Division near
e artillery brigade and infantry reserve be-
nth Division. A cavalry brigade was posted

on the left bank of the Taitzu River, opposing the Russian cavalry which operated between the Liao and Hun. The main base of supply for the army was Liaoyang, with a large intermediate depot at Hsiaopeiho. A brigade each of cavalry and infantry were detailed to guard the line of communication.

The Third Army received orders to advance February 27 with the general object of turning the Russian right and compelling a retreat from the strong lines of the Shaho. On the night of February 27 the army occupied the following positions: Ninth Division, Mamikai to Kuotaitzu, artillery brigade and infantry following; Seventh Division, Lok[illegible]-Sojushi; First Division, Mashanchiatzu to Kalima; cavalry brigade, Chechangkantzu (right bank of the Liao). In its advance this day the army swept the Russian cavalry patrols before it without any fighting.

February 28.—The orders for the day were: Ninth Division to line Ssufangtai-Changchiwopeng; artillery brigade and infantry reserve to Tatzuying; Seventh Division to Tahoangchipu; First Division to Chentzukou; cavalry brigade to Yanglanchiapu (right bank of the Liao). The enemy's cavalry at Ashihniu, Wupanyulu, and Shya-Kushi resisted this advance, but all columns reached their destination except the Ninth Division, which found Ssufangtai strongly held by the enemy, and therefore halted north of Tsuyutai.

March 1.—As a result of orders, the Ninth Division opened fire on Ssufangtai from the southwest at noon. In advancing to their destinations the Seventh and First Divisions drove back the detachments of Russian cavalry in their front, meeting bodies of considerable size. The artillery brigade advanced to Suchiaan, from which place it fired on Tapingchuang, dislodging from the latter village a force of some 15 Russian squadrons, which retreated northeast. A part of the brigate then took position at Tapingchuang and opened fire on the Russian rear at Ssufangtai. In spite of the enveloping fire the Russians continued to hold the village until dark, when they retired. The Ninth Division had made preparations for a night attack, which was launched at 11 p. m., only to find the village practically evacuated, the affair ending in a comparatively insignificant skirmish.

ch 2.—Continuing the flanking movement, the Ninth on was ordered to proceed on this day to Linchiatai, if le; Seventh Division to the vicinity of Shalingpu; Division to Lamuho, and the cavalry brigade to Maiatzu on the Hsinmintun highway. The Ninth Di- which had occupied Ssufangtai the night before, he Russians holding a strong defensive line eastward e latter village, and owing to the failure of the Army to make the advance anticipated was unable ed farther than Santaitzu, before which village it nd fronted the enemy the night of March 2–3, keepact with the Second Army. The Seventh and First s reached their destinations about noon without ring any force of the enemy. At this time informa- received through a spy (later found to be untrue) Russians were retreating north from Mukden. It dingly deemed necessary to atack the enemy and s far as possible. The Seventh Division was or- the line Tehsiangyintzu-Tatzupu and the First to the line Chienmintun-Hsiniulu. The cavalry ached Chinchiatai and the artillery brigade and eserve reached Shalingpu by 6 p. m. A second cavalry was this day attached to the Third Army st posted at Panchiatai to close the gap and keep ection between the Ninth and Seventh Divisions.

the Russians advanced toward Shalingpu and th a force estimated at two or three batteries and of infantry, and behind this force a reserve of . The advance of the Russians was directed at etween the Seventh and First Divisions, which n under a cross fire and checked their advance. s, however, continued to hold the front villages ed fire with the Japanese lines till dark.

–The continuation of the flanking movement on this day by the Russian offensive move- ll as to enable the Ninth Division to come up e Russians were holding a defensive position ntun to Changshihtun, and at 7 a. m. launched inst Shalingpu with a force estimated at 30 army corps (Sixteenth). Shalingpu was oc- time by the artillery brigade and infantry reserve, which engaged the enemy. As on the day before, the direction of the Russian attack brought it under the cross fires from the Seventh and First Divisions, and the attack was repulsed, the Russians losing heavily. On the extreme Japanese left the Russians also made an offensive demonstration with a force estimated at 1 brigade of infantry, 25 squadrons, and some artillery. The Japanese cavalry brigade, reenforced by two battalions of infantry, intercepted this force at Tafangshen. The Russians advanced to within 500 yards from the Japanese line, but retreated in the evening without any severe fighting. In this affair the Japanese cavalry fought dismounted. On this day a division from the Second Army replaced the Ninth Division, enabling the latter to move north past the enemy and to reach Linchiatai, where it again came into communication with the Seventh Division.

March 4.—The different columns were ordered to direct their march as follows: Ninth Division on Mukden station, Seventh Division on North Tombs, First Division on Chengitun. At 1 p. m. the Seventh Division reached Fentai, where it was learned that the enemy was occupying Likuanpu; so one regiment from this column was assigned to attack it from the direction of Yuchiatun. The enemy was posted behind strong intrenchments and the Japanese did not press the attack, only driving the Russians from some of their advanced trenches. A part of the artillery brigade assisted in the attack. The First Division reached Tashihchiao without meeting any of the enemy. The Ninth Division reached Changshihtun in the evening after more or less skirmishing. The enemy's main defensive position had now been clearly developed, the right wing being at Tafanhsintun and extending through Likuanpu, Yukuantun, Yangshihtun, Machiapu, and continuing thence to Linshengpu, on the Shaho, along the front of the Second Army. The cavalry brigade which joined the army March 2 was on this day joined to the original cavalry brigade, forming a division under one command, to which were added two batteries of artillery and six machine guns. The cavalry division reached Chienshentaitzu.

March 5.—The Third Army was now in front of the enemy's main defensive position and a farther advance to the right

ras deemed necessary. As the Second Army had been
ing up the flanking movement of the Third, the latter
abled to continue its march on the right rear of the
ns. The extension of the Japanese flank on this occa-
as made in part by a transposition of the columns of
ird Army, the Ninth Division being withdrawn and
between the Seventh and First Divisions, the place of
th Division being taken by a division of the Second
As it had been expected to give battle on the 5th,
anese troops were quite close to the Russian positions,
g flank marches and the relieving of troops dan-
perations. The new positions were, however, taken
ut mishaps. The relieving column from the Second
ached Changshihtun in the evening of the 5th and
place of the Ninth Division under cover of the dark-
latter marching to its new position. The cavalry
etained its position at Chienshentaitzu.

6.—Under the new arrangement, the Seventh Di-
d the front from Fentai to Tashihchiao; the Ninth
orth of the Hsinmintun highway and the First
etween Pinglupu and Koushihyang with reserve
chiatzu. At about 11 a. m. and before the Ninth
ad completed its march, the Russians made an at-
about one and one-half brigades against Tashih-
the Hsinmintun highway and north of the same.
on was critical, but fortunately the reserves at
tzu engaged the enemy while troops from the
sion deployed from the march. The artillery
k position at Houchang, from where it fired on
By 3 p. m. the attack was checked and the situa-
d. The Russians held a defensive line from
through Tachiatzu to Hsiaochiatun. On this
alry division was at Erhtaitzu, opposing the
lry.

-Up to this time the operations of the Third
nsisted mainly of maneuvers having for their
h the enemy's right rear, and such fighting as
lace was of a comparatively mild character.
te on, however, desperate fighting commenced,
ntil the end of the battle. The object of the

Third Army now was to break the Russian line between Chengitun and the North Tombs. For the severe fighting which was now anticipated the reserve of the Third Army was strengthened by the addition of the two and one-half brigades from the general reserves of the Manchurian armies, which brigades reached Mashanchiatzu on this day. The brigades of the reserve were assigned to the different columns by the army commander from day to day, according to the necessities of the situation. The Seventh Division was ordered to direct its march on the North Tombs; the Ninth Division on Yunsontun, and the First Division on Chengitun. By evening the First Division had reached the line Siutaitzu-Chengitun. The Ninth Division attacked Chaohuatun, which was stubbornly held by the Russians all day, but carried by a brilliant assault in the evening, with heavy losses on both sides. The artillery brigade assisted in this attack. The Seventh Division attacked Chuanwanchiao and Tafanhsintun, but was unable to occupy this village until evening. The cavalry division advanced to line Tashintun-Lichiaputzu, opposing the enemy's cavalry. An attempt to destroy the railway north of Hushihtai by the cavalry was not successful.

March 8.—The day's orders were for the Seventh Division to march on Kinchiauatzu, the Ninth Division to the village at junction of principal road and railroad, the First Division to Yunsontun. Information had been received in the morning that the Russians south of Mukden had abandoned their positions on the Shaho and had commenced to retreat. The task of the Third Army was now to press the enemy hard and, if possible, to intercept his retreat. One brigade from the Seventh Division, which made an attack on Hsiaofanhsintun, was repulsed with heavy casualties. The main body, however, having driven back the Russians from Chuanwanchiao, made continual attacks on Hsiaochiatun, but did not carry the village until evening. The Ninth Division, with the artillery brigade, meanwhile attacked Tachiatzu, and after a severe fight occupied the place about 1 p. m. The Russians lost very heavily in this affair. The First Division attacked the enemy's line Yuanchentun-Santaitzu, but after fighting all day failed to carry the position, the Russians receiving constant reenforcements. The cavalry division was at Houshintun skirmishing with the enemy's cavalry and infantry, fighting both mounted and dismounted. The left of the Second Army, which had been checked in its attack of the 7th, was still fronting the Likuanpu position. The advance of the Third Army on this date had not made the progress expected, both flank columns having failed to accomplish their appointed tasks, but the situation was such that each column looked forward to a successful night attack.

March 9.—During the night of March 8–9 it was heard that the Russians north of Mukden were also retreating, and that the First and Fourth Japanese Armies were approaching the Tiehling road from the east. With a view to cutting off the retreat a further movement to the north was deemed necessary, and a new disposition of the columns of the Third Army was decided upon. The Ninth Division was ordered to the left of the First Division, the place of the Ninth being taken by the Seventh Division. The latter division proceeded north to Siutaitzu with its main body, from where it made an attack on the Russian position Santaitzu-Tachiatun. This attack failed. The First Division made a night attack on Santaitzu and Yuanchentun, which also failed, and the division spent the entire day before the Russian position. At about 1 p. m. a brigade of Russians suddenly appeared on the left flank of the detachment of the First Division attacking Yuanchentun and compelled it to fall back to Chengitun by a flank fire. The violent dust storm of this date obscured objects and enabled the Russians to approach quite closely before being discovered. The reserves of the First Division, however, drove off the Russians, and at 2 p. m. another detachment from the First Division essayed a fresh attack on Yuanchentun. At about 6 p. m. the Russians resumed the counter attack with a force estimated at one division, again compelling the Japanese to fall back on Chengitun. The Russians pushed their attack as far as Chengitun, but were driven off with the cooperation of a brigade from the army reserve, which arrived at this time. The Ninth Division, which had been concentrated near Taochiatun, launched an attack about 2 p. m. with its main body against Hsiaochiaotzu, and with a detachment against Hushihtai. The main body first drove the enemy, about four battalions, from Kuochitun, then occupied Kuoshantun and opposed the Russians at Tungchangshang. The detachment dispatched in the direction of Hushihta could only get as far as Waishutzu, where it was stopped by the resistance of the Russians. Owing to the dust storm the artillery brigade did not take part in the fighting of the 9th. The cavalry division was at Tashintun and Houshintai, opposing the enemy's cavalry.

March 10.—The Seventh Division made a night attack on the enemy's line Santaitzu-Tachiatun with four battalions, and, breaking through the first line, penetrated the forest of the north tombs, and after severe fighting reached the tomb inclosure, behind which they maintained themselves against the Russian counter attack. The Russians in the meantime reoccupied their line between Santaitzu and Tachiatun, cutting off communications with the four battalions in the tombs, which were for the time being given up for lost. Early on the 10th another part of the Seventh Division attacked Tachiatun, assisted by some batteries of the artillery brigade. The Russians made a strong fight, but Tachiatun was finally carried at 4 p. m. By this time the necessity for strong resistance on the part of the Russians had ceased, their army having practically all retreated beyond the front of the Seventh Division. During the retreat of the Russians through the forest from Tachiatun they met with considerable loss from the four battalions of Japanese shut up in the tombs, who fired on them while passing. By 5 p. m. the entire forest was fully occupied. The Second Army was still being held on this day before the Likuanpu position, and the gap between it and the Third Army was temporarily closed by a brigade of the army reserve at Hsiaochiatun. Owing to the retreat of the Russians the Second Army was, however, enabled to extend its left as far as Chuanwanchiao.

The First Division was finally able to occupy Santaitzu at 5 p. m. and Yuanchentun later in the evening, after strong resistance by the Russians. During the night of the 10th the Ninth Division established communication with the Fourth Army at Yulingpu.

The Ninth Division, now on the left, attacked Tungchangshang with the assistance of the artillery brigade, capturing the place a little after noon and pushing its front line to the st of the village. The detachment which had reached aishutzu the previous day made an attack on this place, ut was repulsed. About 2.30 p. m. the Russians counter ttacked with about one division from the direction of Huhihtai, but they were in turn repulsed with considerable loss.

The Russians continued to hold until nightfall a defensive ine through the villages immediately west of the railroad rom Waishutzu through Hsiaochiaotzu to Yuanchentun, overing the retreat of their forces over the ground between the railroad and the Tiehling highway. The advance of the Fourth Army reached Yulingpu at noon of the 10th, and the advance of the First Army reached Puho, but before either could join hands with the Third Army the main part of the Russian retreat had passed. The events of the 10th ended the fighting of the Third Army, which now proceeded to change its flank position to a front position, with the Ninth Division on the right, the First Division in the center, and the Seventh on the left.

The Japanese report more than 26,000 Russian dead as having been left on the field of battle and estimate the Russian wounded at 90,000, a number not at all disproportionate to the killed. The number of prisoners have been generally put at about 40,000, but General Kodama informed one of the attachés that the prisoners of war numbered only 21,000, a number which agrees more nearly with a later published statement of the total of Russian prisoners detained in Japan. Large quantities of military property also fell to the lot of the victors, including the following:

Field guns		60
Rifles		60,000
Transport wagons		1,200
Artillery ammunition	rounds	200,000
Rifle ammunition	do	26,000,000

The Japanese losses were admitted to be about 50,000 in killed and wounded, a figure which is generally conceded to be below the mark. Judging from certain figures of losses in divisions and armies, I am of the opinion that the Japanese casualties easily exceeded 60,000 and may have reached 75,000. Even at this latter figure their losses were materially less than those of the Russians, a somewhat remarkable must be taken into consideration that in the two weeks' battle, the Japanese were continually attacking the Russians in fortified positions.

That the Russian right wing was considerably demoralized and in confusion at the termination of the battle is clearly proved by the testimony of the battlefield. A ride along the Russian line of retreat between the highway and railroad for a distance of 3 miles north of Yuanchentun on March 11-12 revealed an enormous quantity of abandoned property, transportation, clothing, equipments, and, most significant of all, rifles, which had been cast aside in large numbers.

REMARKS.

In the numbers engaged and in the extent of front covered, the battle of Mukden surpasses any battle of the past century, and no single observer could hope to master all its details. Being familiar with the operations of but one army, the Third, any deductions or comments on my part must seem hazardous. I, however, venture the *following* observations:

1. The conception of the Japanese to surround the Russian army by advancing both flanks with a force whose numerical superiority was practically insignificant must be *viewed* as exceedingly bold. In the absence of any marked superiority in numbers, such strategy can only be justified by a *marked* superiority in the quality of the troops and their leaders. That this superiority of quality is taken into account *by* the Japanese in their calculations seems certain. As one Japanese staff officer puts it, "A Japanese division is *equal* to a Russian army corps."

2. Much has been heard of the Russians possessing a large cavalry force, reported at 30,000 sabers. I am unable to give any satisfactory explanation for the almost negligible part played by this cavalry in the battle. The country over which the Third Army operated is ideal for cavalry movements and the opportunities for harassing the movements of that army abundant. The Russian cavalry must either be overrated as to numbers or must be of an indifferent quality. The Japanese cavalry, on the other hand, appears to have fulfilled its functions in a highly creditable manner. One thing is certain, that up to the

esent time (April, 1905) the Japanese cavalry has held s own against the Russians at all points. In fact the apanese cavalry is, in my opinion, a much better force han the estimate generally placed upon it at the beginning of the war. While not an ideal horseman nor ideally ounted, the Japanese trooper is an exceptionally intelligent soldier and thoroughly trained. In the modern duties f scouting and reconnoissance it is often more a question f wits than superior horsemanship and, in this particular t least, the dull and stupid Cossack is no match for his more clever adversary.

3. The lack of initiative on the part of the Russians was noticeable on several occasions. On March 2 and 3 a considerable gap separated the Ninth Division from the remainder of the Third Army, which would have afforded a good opportunity to a more active and wide-awake enemy. True the Russians delivered strong attacks on these days, but they were misdirected. Again, on March 8 and 9 there was a gap between the Second and Third Armies of which the Russians failed to take any advantage, even after they had repulsed the Seventh Division in its attack on Hsiaofanhsintun on the 8th. The attachés of the Third Army were at Chuanwanchiao on the 8th and they inform me that this village was under not only a front fire, but also under fire from the right rear where the Russian position jutted behind the front of the Third Army. On the evening of the 8th the attachés with the Third Army thought an attack by the Russians against the gap between the Second and Third Armies was imminent. It must be observed, however, that the order for the general retreat of the Russians had already been given twenty-four hours earlier, and that serious offensive operations no longer formed part of the Russian programme.

The transposition of Japanese columns on two occasions when the troops were already engaged must also be viewed as hazardous undertakings in the presence of a wide-awake enemy, although performed at night and favored by the ground, as was the case. Here also the Japanese relied upon a besetting fault of their adversaries, namely, that when once safely intrenched the Russians will not leave their defenses unless driven out.

4. During its entire advance the Third Army at no time fought a general engagement. All the fighting consisted of isolated combats for the possession of villages which were utilized by the Russians as defensive points, fieldworks and hasty intrenchments being impracticable owing to the frozen ground. Some of these combats were very bloody in character. The ground being perfectly bare and without cover of any kind, the attacking troops were under fire at all times from extreme ranges down. In my judgment, there is no better tribute to the quality of the Japanese troops than their achievements in capturing such villages as Chaohuatun and Tachiatzu. I question whether any umpire at peace maneuvers would ever rule in favor of the attack under the conditions which existed on March 7 at Chaohuatun.

6. So far as I am able to judge from the facts, the operations of the Third Army were directly responsible for the issue of the battle. The so-called Army of the Yalu, which operated in the hilly country to the east and northeast of Mukden, could not make much progress. It undoubtedly played an important rôle in making the Russian commander apprehensive for his left wing, and the Japanese prefer to believe that General Kuropatkin was deceived into thinking that the entire Third Army was operating on this flank. The task of the First and Fourth Armies appears to have been limited to containing the Russians in their strong lines on the Shaho. To the Second and Third Armies was assigned the task of turning the Russian right wing. Although effectually checked by the strong position at Likuanpu, the fierce attack of the Second Army on this point kept the Russian reserves on the right wing occupied, enabling the Third Army to continue its flanking movement.

7. Although the Third Army succeeded in reaching a position favorable for cutting the Russian line of retreat as early as March 9, it was unable to break in on the line owing to the excellent defense of the Russians. Had the Japanese been able to reach the railroad on the evening of March 9, or even earlier on the 10th, the fruits of their victory would have been much more extensive. On the 10th, especially, the left of the Third Army fronted the railway the entire day at a distance of from 2,500 to 3,500 yards, and was compelled to watch the Russians streaming by hour after hour without

g able to break through the strong defensive line west he railroad. As the Fourth and First Armies both hed the Tiehling highway in the early afternoon, the of the Russian troops were compelled to retreat through rrow lane several miles long extending from the railway he Tiehling road, much of this ground being under long-ge artillery fire. The defense of the Russians along the t of the Third Army was magnificent, but, in justice to Japanese, it must be observed that their troops had been ching and fighting night and day for twelve days, giving receiving heavy blows, and they were therefore in no dition to break the Russian desperate resistance at the hour.

The retreat of the Russians was further favored by the st storm on the 9th, which prevented the use of artillery, d by exhaustion of the artillery ammunition of a part of Japanese artillery on the 10th.

ATTACK ON CHAOHUATUN.

Chaohuatun was the scene of an important combat on arch 7, in which the Ninth Division, Third Army, by a illiant assault broke the Russian defensive line and threat-ed the line of retreat. My personal view is that this affair, ore than any other event, decided General Kuropatkin to der the retreat of his army, which commenced the night f March 7–8. The Pu River, with a general course from ortheast to southwest, flows west of Chaohuatun, about ,200 yards distant at its nearest point, and played an im-ortant part in the combat. Like all the streams of this egion, it has a sunken bed, which in this case was about 25 eet wide at top and 8 to 10 feet deep. For the details which ollow I am largely indebted to information kindly furnished y the other attachés of the Third Army.

At this time the Russians were holding a defensive line hrough Chuanwanchiao, on the Hsinmintun road, to Chao-uatun, thence northeastward and eastward through Siutaitzu and Chengitun. Except for the villages, the lines lay in the open, save for such scant cover as the few accidental features (Chinese tombs, etc.) afforded. On the morning of March 7 the Ninth Division approaching from the northwest, first occupied Waniutun, expelling a detachment of

Russian cavalry. The left brigade of the division, which had been assigned to attack Chaohuatun, then entered the stream bed from the north, marched along the ice under cover of the banks, and fronted the Russian position. The mountain guns of the division were posted on both flanks of Koulingchitun (on the west bank of the stream and about 1,600 yards directly west of Chaohuatun). The artillery brigade at first took up a line through Houchang, at a distance of some 4,000 yards. The forenoon was taken up by an artillery duel, with the Russian batteries located generally on a line about 1 mile southeast of Chaohuatun; the Japanese, however, firing occasionally on the village and Russian lines. Toward noon the infantry commenced their attack, entering the stream bed from the north and marching along its length till opposite their places and moving from the bed in deployed formation by successive platoons or sections.

At 1.45 p. m. the headquarters Ninth Division moved to a point about 2,500 yards from Chaohuatun, the attaché at the same time entering the stream bed in the vicinity of Waniutun, where they had an excellent view. At this time the first line of Japanese infantry was about 600 yards from the village with a few advanced groups. The ground over which the Japanese were advancing was perfectly bare and open. Behind the first line were numerous zugs and sections, all deployed as skirmishers with considerable intervals, which continually reenforced the firing line, advancing by rushes. The interval in the firing line was maintained at about 1 pace. Successive reenforcements, a company at a time, kept entering the stream bed from the north and deploying therefrom by platoons or sections. Whenever fresh troops emerged from the stream bed they were met by Russian shrapnel. The Japanese kept extending their lines to the left so as to take the village more from the north. At 4 p. m. the Japanese firing line was 400 yards from the village. The lightly wounded made their way back to the stream bed, where they were attended by the surgeons at the battalion dressing stations. The Japanese officers exposed themselves fearlessly, standing in the open and giving directions to their troops as they moved from the stream bed.

At about 4.45 p. m. a battery of the artillery brigade

d forward with large intervals—about 100 yards—and
post near Koulingchitun, only 1,600 yards from the
ian position. The other batteries gradually followed, the
ntain guns having also advanced several hundred yards
ie edge of the stream. During the advance of the artil-
the Japanese firing line was materially strengthened.
.45 p. m. the Japanese were 300 yards from the village,
le Russians in the open could be seen falling back indi-
ially. At 6.30 the firing line was 150 yards from the
age. At this time the Japanese reenforcements were
ing to the left on the north of the village and in closed
mation. The Japanese artillery concentrated its fire on
village and its rear. At 6.55 the Japanese appear to
e entered the village from the left, the Russians leaving
the Japanese entered. In the open the Russians did
wait for the lines to close, but fell back as the Japa-
e reached within 200 to 300 yards. It was quite dark
en the Japanese were in possession of the village, which
s in flames, as were also Houchang, Koulingchitun, and
uanwanchiao. While the attack on Chaohuatun was
ing made another brigade was attacking the Russian line
rth of Chuanwanchiao. This part of the line was car-
d at the same time as Chaohuatun.

The Japanese took their first reserve of infantry ammu-
tion with them on pack ponies into the stream bed.
rom the stream bed ammunition was carried to the firing
ie by soldiers carrying slings on their shoulders and ad-
ncing in skirmish order. As a rule the Japanese infantry
going into action is supplied with extra ammunition
rried in haversacks, bento bags, etc., so that each man has
total of 300 to 400 rounds. As soon as he has expended his
extra" ammunition, and before touching that in his belt
ouches (120 rounds), he reports himself to his officers as
entirely out of ammunition."

The Japanese lost about 2,000 in the attack on Chaohuatun.
n March 9 I rode over the field, which had not yet been
leared. I observed that the dead lay in well-defined lines,
rom which it would appear that the losses were greater
luring the long halts lying down than during the brief
eriods of the rushes. This agrees with observed facts, the
ttachés stating that they observed very few men fall during

the position. The dead lay from about 150 yards in front of the village down to the stream bed. Judging by the lines of dead the positions were from 50 to 100 yards long.

ATTACK ON TUNGCHANGSHANG.

This incident shows the daring with which the Japanese handled their artillery. After the capture of Kuoshantun by the Ninth Division on the 8th, the Japanese infantry was opposed by the Russians at Tungchangshang, the outer walls of the villages being but 500 yards apart, as determined by pacing. The Russians resisted stubbornly and the Japanese infantry could not dislodge them. Two batteries of the artillery brigade were accordingly pushed forward from Kuoshantun on the morning of the 10th and, taking post behind the eastern walls of Kuoshantun, fired on Tungchangshang with high-explosive shells. The Russians made their counter attacks against Kuoshantun, but were repulsed. Finally they were driven out of Tungchangshang, mainly by artillery fire, and the Japanese infantry was able to push the lines to the east of this village in the early afternoon of the 10th. The artillery naturally suffered some loss in this affair, but its services decided the issue. In fact, the artillery brigade rendered most conspicuous service during the battle, and its commander received the following commendatory letter from General Nogi:

To the first brigade of field artillery:

During the engagement on the 7th of March in the neighborhood of [illegible] and Chaohuatun an attack carried out by the Seventh and Ninth divisions was severely checked. At this critical moment the field artillery brigade left its position near Houchang and regardless of losses advanced for 2000 meters over perfectly open ground under the enemy's fire. The brigade then took up its position near Koulingchitun and poured a heavy concentrated fire on the enemy, thus giving great assistance to the attack.

Again, at the attack of Tungchangshang by the Ninth Division on the 10th of March, the second battalion of the —— Regiment, forming part of this brigade, advanced about 1,500 meters under a severe fire and came into action at a distance of only about 500 meters from the Russian position, opened a heavy fire on the enemy, thereby affording invaluable support to the attacking infantry. Moreover, when the enemy delivered a vigorous counter attack this battalion aided materially in repulsing it by the intensity and accuracy of its fire.

In recognition of the valor and great merit of the above deeds I have the honor to confer this "Konjo."

General Baron Kiten Nogi.

This is the same artillery brigade that was so efficiently andled during the siege of Port Arthur. Its losses during he battle of Mukden were 15 officers, 350 rank and file, and ome 300 horses. Each gun fired an average of 550 rounds during the battle.

It being impossible to dig gun pits during the period of fighting, the guns of the artillery brigade were provided with provisional plate shields wired to the cannoneer's seats each side of the piece. This provided a fair degree of shelter for the crew against shrapnel.

While on the subject of artillery, I may observe that the efficiency of the Japanese artillery in the present war is in a considerable measure due to the fact that it carries a liberal supply of high explosive shell, whereas the Russians fire shrapnel only. Against cover of any kind shrapnel is practically valueless, and an artillery provided with shrapnel only will often find itself in situations where it is powerless to inflict damage on the enemy. With a varied supply of ammunition the Japanese possess a decided advantage over the Russians, notwithstanding that their gun is distinctly inferior in power to the Russian gun. Several instances will serve to illustrate this point. On March 4 the Japanese at Yuchiatun were subjected to an intense shrapnel fire from the Russians for over an hour. The village was filled with troops of all kinds, sheltered behind buildings and walls, and, although it rained shrapnel bullets, but two men were wounded, one of them a doctor. I have this on the authority of the attachés who were in Yuchiatun at the time. Again, at Kuochitun, on March 10, the Russian shrapnel burst well over the village without doing any damage to the troops therein. Chaohuatun and Tungchangshang, on the other hand, are examples of the effects of Japanese shells. In fact, all of the villages attacked by the Japanese artillery reveal the effective work of the shell in their breached walls and wrecked buildings.

In connection with the combat at Tungchangshang it seems appropriate to describe the events of the 10th, which I witnessed from the village of Kuochitun. Shortly before noon the attachés were permitted to enter the village, which was in the line of the artillery brigade. The ground eastward from the railroad has a slight dip to the railroad, thus affording an excellent view point. As we entered the village Japanese batteries were firing in the direction of the railroad, apparently at some batteries east of the track, one of which was plainly visible projected against the sky line, while others could be located by their flash. A Japanese infantry force, apparently a brigade, was just completing its deployment in the direction of Yuanchentun, the first line, lines of supports, and reserves appearing as faint brown streaks from our view point. At this hour the atmosphere was hazy and the sun in my front, so that nothing could be made of the Russian position except a couple of the batteries east of the railway. There were also one or more Russian batteries at Yuanchentun which could not be definitely located, but, from what followed and from an examination of the ground on the following day, I think the position was just west of Yuanchentun, screened by the trees and tombs of a Chinese burying ground at this point. The Japanese artillery was posted behind village walls, except two batteries in a sunken road north of Chengitun. The deployment of the Japanese infantry appeared to be against Yuanchentun and to the north of this village. The infantry had piled their knapsacks on the ground between Chengitun and Kuoshantun before going into action.

A steady and sustained artillery fire was going on from both Russian and Japanese guns, the former dividing their attentions between the Japanese batteries and the infantry deployed in the open. The Russian artillery practice was good, and I am satisfied that all the Japanese troops in the open suffered heavily. On the villages the shrapnel, although bursting well, produced no effect, and the losses here were insignificant.

In spite of their losses the Japanese infantry held its ground all day in the open. From time to time a light line of dust showed where the first line had made a rush. No infantry fire could be heard, although this does not prove that there was none, for the distance was considerable and the noise of the artillery and bursting shell confusing. Up to the time of darkness the Japanese infantry had not assaulted the Russian position.

The target of the Japanese guns could not at first be made ut clearly, but with the improving light of the afternoon t was found to be the Russian column of retreat marching n the road parallel to the railroad track. At about 3 p. m. the Russian troops could be plainly seen on the road, infantry units, batteries, cavalry detachments, trains succeeding one another closely, and this procession kept up until darkness intervened. At first the Russian troops appeared to be fairly well in hand and their march orderly in spite of the Japanese fire, but after 5 p. m. the organizations were more broken, with numerous stragglers and small groups.

From Yuanchentun north for about 1,000 yards the railroad runs in a cut and the wagon road alongside on the east lies on the top of the bank, exposed to fire. North from the bridge at this 1,000-yard point the railroad is on an embankment, with the wagon road close up against the embankment and still on the east side, being thus screened from the Japanese fire for a considerable distance.

The Japanese artillery concentrated its fire on the section of road exposed to view, and their shrapnel could be seen bursting well over the retreating column. At 3.30 p. m. the Japanese batteries at Chengitun ceased firing, owing to the exhaustion of their ammunition. About 4.30 p. m. a new Russian battery opened up from an invisible point some distance north from Hsiaochiaotzu, bringing a sharp oblique fire on Kuoshantun. This fire lasted only half an hour.

At 5.30 p. m. a Russian battery came into view on the north side of and close to Yuanchentun, making for the railroad crossing at a trot. After about half the carriages had crossed the track one of the teams was seen to stop, compelling the following carriages to turn out in order to pass it. Shortly after the withdrawal of this battery a Russian line of skirmishers was seen to rise from the ground west of the railroad and north of Yuanchentun. This line fell back, being joined by supports and reserves, and reached the wagon road in a confused mass, the men moving hither and thither. An officer on horseback was seen riding back and forth, evidently endeavoring to assemble his troops. The body, which was about one battalion, finally moved off in fairly good order. In the gathering darkness more Russian skirmishers could be seen rising from the ground farther north and falling back to the road. The Russian batteries east of the railway fired steadily, and at the time of my withdrawal, 6:30 p. m., were still in action. The artillery fire kept up for about half an hour longer, but about 7 p. m. firing ceased and the twelve days' battle was ended.

The Russian troops whose retreat I witnessed were undoubtedly those who had been opposing the Japanese up to the last day on the west side of the railway at Santaitzu, Tachiatun, and the Imperial Tombs. Considering the position of the Third Army on the 10th and that the advance of the First and Fourth Armies had reached the Tiehling road on the same day, the covering of the retreat of their last troops must be viewed as a skillful tactical achievement on the part of the Russians.

After the battle the Fourth Army continued the pursuit of the Russians along the line of the railway, occupying Tiehling March 16, Kaiyuan March 19, and Changtufu March 21.

The Third Army changed front on March 11 and 12, facing north with the Ninth Division on the right, the First in the center, and the Seventh on the left.

On April 13 the Third Army moved across the Liao River, army headquarters and the attachés' camp being established in Achiniuluputzu.

On May 4 the Third Army made a third and final advance to the line Fakumen-Chinchiatung, army headquarters and attachés' camp being at Fakumen. The Japanese did not at first have accurate maps of the region penetrated by the Third Army, but their surveyors were soon at work and fine maps, scale 1:50,000, soon appeared. Unfortunately these good maps were withheld from the attachés, and I was unable to secure any copies.

Coincident with the final movement of the Third Army to the north, the Second Army moved out from its position in reserve at Mukden and occupied the front between the Third and Fourth Armies. With the final adjustment of their lines in May, 1905, the Japanese armies from right to left occupied the following order: Fifth, First, Fourth, Second, Third, with the two cavalry brigades on the left.

The Third Army held the line from Kangpienhsien through

Chinchiatung, with the Fourth Division of the Second Army on the immediate right. The First Division of the Third Army was mainly in reserve, having but one regiment in front line between the Seventh and Ninth Divisions. The Eighth Division of the Second Army was also known to be in reserve, and it appears that the bulk of the Second and Fourth Armies was massed along and on both sides of the railway.

The general expectation of the attachés was that an early movement north would follow the battle of Mukden, probably after the frost was well out of the ground and before the rainy season set in. As the weeks rolled by it became gradually more and more apparent that the Japanese had no intention of leaving their fortified line taken up in May, and it is my settled conviction that if hostilities had continued the Japanese would have gone on the defensive. This conclusion is reached mainly from considerations of the transport difficulties which hampered Japanese mobility; not that they ever suffered for lack of supplies, but that the difficulties presented by the increasing distance from the sea determined the Japanese leaders to proceed no farther than their previously worked out plans of transport would permit. Their advance had carried them beyond the head of navigation on the Liao River, without which they would have had difficulty in supplying their vast forces, estimated at not less than 600,000 all told, even in the positions reached. A distance of 275 miles still intervened to Harbin, and without the occupation of this strategical point any partial advance would not have affected the strategical situation sufficiently to have compelled the Russians to sue for terms. Harbin, in my opinion, was beyond the limits of the Japanese transport methods, which determined the limits of the Japanese advance.

During August, 1905, large reenforcements reached the Japanese lines, including several new line divisions, one of which, the Fourteenth, Lieutenant-General Tsuchiya commanding, was assigned to the Third Army and stationed to the left rear of the Seventh Division, with headquarters about 8 miles west of Fakumen. The arrival of these fresh organizations did not, in my judgment, indicate any intentions of an offensive movement by the Japanese. They were simply brought forward to meet the constantly increasing strength of the Russians, who had developed a capacity of transport on the Siberian Railroad far beyond the expectation of all judges.

Having reached a decision not to advance beyond their now established lines, the Japanese quietly awaited the next move of the Russians. The latter, having recovered from the effects of the battle of Mukden, commenced reconnoitering the Japanese front from about May 1, displaying considerable boldness and enterprise in these affairs. In the middle of May General Mishchenko, starting from Liaoyangwopeng, rode around the Japanese left flank with a force estimated at about fifty squadrons, and proceeded as far as Shihfossu and Hsinmintun, raiding a Japanese field hospital and transport column en route. Although abundant opportunities existed for doing serious damage to the Japanese, the net results of the raid were insignificant.

Having learned that General Mishchenko was again assembling his cavalry for a raid, the Japanese made an attack on Liaoyangwopeng the night of June 15–16 with the Fourteenth Brigade of Infantry, four batteries, and the two cavalry brigades. The advance was made in two columns, each column consisting of one regiment of infantry, one brigade of cavalry, and two batteries. Each column was preceded by a thick line of skirmishers thrown out by three advanced companies, which followed in close order, with intervals of 100 meters. The cavalry brigades marched on the right flank of the right column and on the left flank of the left column. Two companies for each column, at 1,000 meters, protected the flanks not covered by the cavalry. The remaining seven companies of each regiment, with the artillery, followed on the roads close behind the supports of the skirmish line. The Russians were struck at 4 a. m. by the right column, the Twenty-seventh Regiment, and completely surprised and routed, their camp destroyed, and considerable property captured.

With the exception of Mishchenko's raid and the attack on Liaoyangwopeng, no other affairs of any importance occurred on the front of the Third Army. I except, of course, the numerous collisions between patrols operating in front of the outposts, which were of frequent occurrence

The Russians appeared in the direction of Chinchiatung several times in considerable force and bombarded at extreme ranges, but never came to close quarters.

The methods employed by the Japanese for securing their front differed in no way from those prescribed in the regulations of all armies. There was the usual fortified line of resistance, and in front of this was the fortified line of outposts, and beyond this the observation line.

On September 9 General Fukushima, of Manchurian headquarters, was deputed to arrange the terms of an armistice, and on September 11 firing ceased along the outpost line, thus terminating hostilities.

GENERAL CONCLUSIONS.

In the absence of more detailed information any general deductions as to the lessons of the Russo-Japanese war must necessarily be viewed with considerable caution. Considering the magnitude and duration of the war and the fact that it is the first great war between nations having modern arms and training since 1877, one might reasonably expect some startling and original methods. If there is one fact more than any other which has impressed itself on my mind it is that, in its general features at least, the war was conducted by both sides along strictly orthodox lines. The formation of infantry for the attack, the massing of guns, and the concentration of their fire, the value and employment of field fortifications, the siege of permanently fortified localities, and many other features, all savor strongly of the text-book. So far as I am able to judge, the recognized rules and principles for conducting warfare underwent no serious modification in their application.

In two important particulars the war demonstrated the falsity of preconceived ideas, viz, Japanese mobility and the Russian cavalry. With respect to the former, it was generally believed that the Japanese troops would astonish the world by their marching powers, rapidity of movements, and ability to exist independently of established depots and supply lines. The slowness and deliberation of the Japanese movements was distinctly disappointing, especially in view of their preparedness and the brilliant results that might reasonably have been anticipated from rapid operations early in the war. Instead of the rush of the avalanche it was the slow but irresistible creeping of the glacier that characterized the Japanese advance. The Japanese transport system, excellent enough in its way, was responsible for this result. Instead of the supply depot and line of communication being subservient to the movements of the troops, the conditions were reversed and the troops had to wait on the supply department. In the matter of land transport the achievements of the Russians far exceeded those of the Japanese. The transport and maintenance of a force of 1,000,000 men in the theater of war over a single-track railway far exceeded the most liberal estimate and deservedly entitles the Russian transport system to great praise.

With respect to the Russian cavalry, it simply accomplished nothing. Just why this was so must be for others to say. Opportunities for doing excellent work were not lacking, and much damage could have been inflicted on the Japanese by a proper use of the great superiority in cavalry possessed by the Russians.

The siege of Port Arthur has again given prominence to the value and importance of permanently fortified places when occupying strategical positions. Port Arthur in itself possessed no value for the Japanese, but being the Russian naval base and sheltering the main Russian squadron it became strategically of the greatest importance. Among the results contributed by Port Arthur to the Russian cause may be mentioned the following:

1. Neutralizing for five months four out of thirteen Japanese line divisions.

2. Engaging the attention of the whole Japanese fleet for a period of over ten months, thus leaving Vladivostok unguarded and practically an open port for the Russians.

3. Securing time for the Russians to concentrate and oppose the Japanese advance at Mukden.

As was to be expected from the destructiveness of modern firearms, great use was made of night attacks and maneuvers. The Japanese generally utilized darkness for bringing up their troops into position quite close to the Russian lines and thus escaped the losses that would otherwise have been incurred in traversing fire-swept ground in daylight. Some of the night maneuvers of the Japanese were conducted on a fairly large scale, such as the flank marches of the Ninth Division during the battle of Mukden and the attack of a brigade of the Seventeenth Division on Liaoyangwopeng, June 16, 1905. The Japanese appear to have encountered no difficulties in maneuvering their troops in darkness, and I attribute part of their success, at least, to their thorough reconnoissance of the ground before making an advance. It seems quite certain that night attacks and maneuvers will receive a wide application in future wars, and troops should be carefully trained for this work in time of peace.

Another prominent feature of the war was the extended use of high explosives, both in hand grenades and gun shells. The advantages of high-explosive shells to the Japanese artillery have already been pointed out. With respect to hand grenades, while they are no doubt demoralizing, their material results are not very damaging, owing to the intensely local action of high explosives and the shortness of the range. Although used by the Japanese in their field armies, it is doubtful whether sufficient occasions will arise to justify any extended training and preparation with this weapon, which owed its inception and use in the war to the siege of Port Arthur, where the lines were very close together for long periods of time.

In the formations for infantry attacks the Japanese adhered closely to the principles laid down in the drill regulations of all nations having modern armies. The great dispersion which was threatened by the lessons of the Boer war found no application in Japanese tactics. The intervals in the firing line were kept at a pace or pace and a half, a rather close formation theoretically, for modern weapons, but giving a volume of fire sufficient to cope with that of the defense. The Japanese have shown that frontal attacks by infantry over open ground are still feasible when made by good troops, well handled, and supported by an adequate artillery fire. No doubt the successes of the Japanese in this particular must be attributed, in part at least, to the poor shooting of the Russians. On no other basis can I account for the outcome of the Japanese attacks on Shihliho, October 12, 1904, and on Chaohuatun, March 7, 1905.

The expenditure of ammunition, both artillery and infantry, reached extraordinary proportions, and its supply and distribution to the troops will undoubtedly make still greater demands upon the transport system in future wars. The Japanese largely obviated the question of the distribution of ammunition to the firing line by giving each soldier from 300 to 350 rounds before going into action. The Japanese ammunition, caliber .26, weighs almost exactly 5 pounds per 100 rounds, which means that the Japanese soldier carried from 15 to 18 pounds of ammunition on his person. For caliber .30 ammunition the weight for an equal number of rounds would be materially greater, and it is a question whether a soldier could conveniently carry as many as 300 rounds into action. In the battle of Mukden the artillery brigade of the Third Army expended about 500 rounds per gun, or 4 tons in weight for each piece. For the heavier field guns of most armies it is quite possible that a long engagement will call for the expenditure of 5 or 6 tons of ammunition per piece. These figures seem appalling, but they will have to be reckoned with if an adequate ammunition supply is to be maintained.

A noteworthy feature of the three great pitched battles from Liaoyang to Mukden is the enormous front covered by the armies and the long duration of the fighting. At Liaoyang, on August 30–31, the Japanese front extended over 27 miles, more than double the front of the German army at Gravelotte with about equal numbers engaged. At the termination of the Shaho battle the Japanese front covered 40 miles and before the beginning of Mukden 55 miles. During one stage of the battle of Mukden the Japanese front covered fully 80 miles from wing to wing. In duration the three pitched battles far exceeded anything in the annals of war. The extension of front and thinning of lines, together with the long duration of the battles, was undoubtedly due to the containing power of modern firearms, which preclude anything like good troops being run over even by vastly superior numbers.

Machine guns, used sparingly at first, rapidly demonstrated their value and were employed in increasing numbers in the later stages of the war. It seems certain that this weapon will play an important part in the future, and the equipment and tactics of machine guns should receive serious and prompt consideration for our army.

With the great extent of front covered in battle the means of intercommunication between the army units and the commander-in-chief are of the utmost importance. The telephone and telegraph afford all needful facilities for this purpose, and so far as I was able to learn the Japanese communications were never interrupted during battle, and the commander-in-chief was at all times informed as to the state of affairs at all points of his front. It is easy to conceive that in a hostile country the safety of an army's communications might be seriously endangered by overt acts of its inhabitants to such an extent as to paralyze operations; and this suggests the advantages and possibilities of wireless telegraphy, provided it can be simplified and perfected for field use.

In attempting to account for the uniform success of the Japanese arms during the war two prominent reasons occur to my mind: First, their operations were conducted systematically; second, the individual character of the soldier. With regard to the first the Japanese military system was thoroughly worked out and planned down to the slightest detail. They knew the capacities and limitations of their military machine and did not attempt anything beyond. They took no chances and left nothing to chance. Their system was ironclad and rigid, and they stuck to it from beginning to end. It worked as previously planned, but it would have been interesting to learn what would have happened had any part of the machinery gone wrong.

With respect to the individual character of the Japanese soldier, he is unquestionably better, man for man, than the Russian. Not that he possesses more animal courage, but because he is quicker witted, more resourceful and intelligent, and possesses greater nerve and tenacity. In speaking of the soldier I include the officer, for while unacquainted personally with the character of the Russian officer, I can say that the Japanese officer takes his profession most seriously, and that he is highly trained, well educated in his calling, and of correct habits. Besides being intelligent and brave, the Japanese are an essentially warlike people, fond of fighting for fighting's sake. All their history and traditions teem with stories of the brave and chivalric deeds of national heroes, stories which the coming soldier imbibes at his mother's knee. Just how soon the spirit of commercialism will destroy the military spirit of Japan, time alone can tell, but that the latter was a living force during the Russo-Japanese war was apparent to the most casual observer.

ARMAMENT SHEET.

1. Six 28-cm. mortars, mounted, one mortar hors de combat; emplacements for two R. F.
2. Two 47-mm. R. F. naval guns.
3. Five 10-inch high power guns; two 47-mm. R. F.
4. Five 6-inch pedestal mounts R. F.
5. Old Chinese fort: One 15-cm. Krupp, garrison mount; one 3-inch field gun.
6. Eight 9-inch Krupp rifles, model 1870, on F. P. Russian carriages, model 1894.
7. One 10-inch high-power rifle on Krupp C. P. carriage; four 23-cm. howitzers on F. P. carriages.
8. Six 23-cm. howitzers, F. P. carriages; emplacements for two 47-mm.
9. Five 15-cm. pedestals (shielded) R. F.
9a. Three 47-mm. R. F. shielded.
9b. One 47-mm. R. F. shielded.
10. Four 47-mm. R. F.
11. Emplacements for five 6-inch R. F., new battery unarmed.
12. Two 47-mm. R. F.
13. Four 15-cm. rifles, C. P. carriages; two 5-barreled revolving cannon 37-mm.
14a. One 47-mm. R. F.
14b. One 47-mm. R. F.
15. Two 15-cm. R. F. naval.
16. Two 47-mm. R. F.
17. Two 47-mm. R. F.
18 and 19. One 47-mm. R. F. each.
20. Two 5-barreled revolving cannon, 37-mm.
21. Six 15-cm. siege guns, three in position.
21a. One 47-mm. R. F.
21b. One 10.5-cm. siege rifle.
21c. One 47-mm. R. F. in blinded construction.
21d. One 15-cm. siege gun, Krupp pattern.
22. Two 3-inch field guns.
23. Two 15-cm. field howitzers; one 3-inch field; four 8.5-cm. field; four naval 12-pounders; one 12-cm. naval, latter wrecked.
24. Four 47-mm. R. F.; two 12-cm. naval guns, one on improvised siege carriage.
25. Two 15-cm. siege guns; additional burst gun on ground.
25a and 25b. Each two 47-mm. R. F.

26. Two 15-cm. naval guns.

27. Tungchikuanshan, East, five 15-cm. guns, garrison mountings.

28. Battery Q, one 47-mm. (wrecked); one 3-inch field gun (wrecked); one old bronze smoothbore, English make; one 15-cm. siege gun (shot in two); one machine gun, Maxim (wrecked).

29. Battery N, one 10.5-cm. siege rifle (disabled); wrecks of four siege and field gun carriages and remains of one 15-cm. siege gun.

30. Battery M, one 15-cm. naval gun; one 10.5-cm. siege gun; one 7.5-cm. field; one 6.5-cm. mountain.

31. P fort, one 3-inch field gun.

32. Panlungshan, East, four naval 12-pounders and two 3-inch field guns.

33. Panlungshan, West, two naval 12-pounders and four 3-inch field, all disabled.

34. Wangtai fort, two 15-cm. naval.

35. Battery H, emplacements for four 15-cm. siege guns, one gun (disabled) in position; wrecks of three guns and four carriages back of battery.

36. Four 23-cm. howitzers on F. P. carriages, two total wrecks, two damaged.

37. Two emplacements for field guns; one overturned gun in rear.

38. Erhlungshan fort, four 15-cm. siege guns, one serviceable gun remaining; varied mobile armament of machine and small R. F. guns.

39. Sungshuhan fort, two 15-cm. naval, shielded (wrecked); varied mobile armament.

40a. Five 15-cm. field howitzers.

40b. Emplacements for five field guns, two guns (one blinded) in position; emplacements for two 12-pounder naval in blinded casemates, one gun in position; one 47-mm. R. F. shot in two; miscellaneous lot of field and naval guns and carriages, mostly wrecked, on road in rear.

40c. One 7.5 and one 8.5 cm. field pieces and emplacements for four 37-mm.

41. Emplacements for four field guns, one wrecked gun behind.

42. One 15-cm. siege gun, Krupp pattern.

43. One 47-mm. naval, blinded.

44. One 47-mm. open emplacement.

45. Two 47-mm.

46. Four 12-pounder naval.

46a. Two 12-pounder naval, one gun missing.

46b. Two 12-pounder naval (indirect fire).

47. One 12-cm. (4.7) naval.

48. Three 47-mm. mounted; pedestal for one 37-mm.; two 12-pounder guns (one damaged) without mounts.

49. Two 47-mm.

50. Two 12-cm. Krupp pattern, old-style ship mounting, blinded.

51. One 47-mm.

52. Two 10.5-cm. siege guns; emplacements for two additional guns.

53. Naval gun battery; two 15-cm. and one 12-cm. mounted; one 15-cm. and one 12-cm. burst.
54. Cathedral Hill, two 12-cm. Krupp pattern, old-style ship mounting.
55. One 47-mm. naval.
56a. One 12-pounder naval.
56b. Two 47-mm. naval.
56c. One 47-mm. naval.
57. One 15-cm. naval.
58. Three 47-mm.
59. Four 23-cm. howitzers; additional burst gun on ground.
60. One 15-cm. siege gun, Krupp pattern, burst.
61. One 15-cm. naval.
62a. One 3-inch field gun, blinded.
62b. Three 10.5-cm. siege guns.
62c. Two 15-cm. field howitzers.
62d. One 3-inch field gun, blinded.
63. Four 12-pounder naval; emplacements for three more.
64. Two 47-mm.
65. Two 47-mm.
66. Two 47-mm.; emplacements for third gun.
67. Three 15-cm. siege gun, emplacement for fourth; one 12-cm. naval; one 47-mm.
68. Two 47-mm.; one 37-mm.
69. Five emplacements for 15-cm. guns, garrison C. P. mountin (four guns present, fifth knocked out); one 12-pounder. naval.
70. One 6.5-cm. mountain gun; one 37-mm.
71. Itsushan: Three 12-pounder naval, one partly mounted; pedestals for two 12-pounders and one 47 mm. On parade behind parapet one damaged 3-inch field gun, four 12-pounder guns without mounts, of which three damaged; three 15-cm. siege and one 15-cm. field howitzer, apparently serviceable.
72. One 3-inch field gun, emplacement for second.
72a. Two emplacements for field guns, no armament.
73. One 3-inch field gun.
74. Two emplacements for 15-cm. siege guns, one gun in place.
74a and 74b. Emplacements for field guns, no armament.
75. One 47-mm. blinded and two 47-mm. open emplacements; one additional emplacement for 47-mm.
76. Three 47-mm. open emplacements; one 47-mm. blinded.
77. Two 37-mm. blinded.
78. One 47-mm. and one 37-mm.
79. Four 15-cm. siege guns, two 12-pounder navals, one 15-cm. howitze three 3-inch field guns, one 47 mm.
80. Two 12-pounder naval guns.
81. Two 47-mm.
82. Emplacements for eight field guns, no armament.
82a. One 12-pounder naval, open emplacement.
83. One 12-pounder and one 47-mm. naval.
83a. Two 47-mm.

. Two 47-mm.
. One 47-mm.
1. One 37-mm.
Two 47-mm.
. Taiyangkou fort: One 3-inch field; one 12-pounder naval, two 15-cm. naval (one wrecked); emplacements for 37 and 47 mm. guns along infantry parapet; guns and parts of carriages collected on parade.
5. One 3-inch field gun.
7a. Two 3-inch field guns.
7b. Two 12-pounder naval.
8. One 15-cm. old pattern Krupp on old-style ship's mounting.
9. Two 3-inch field guns.
90. Taiyangkou battery: Six 15-cm., F. P., garrison mounting, siege guns (No. 4 gun burst), and one 15-cm. naval gun.
91. Two 37-mm., with pedestal for third gun.
92. One naval 12-pounder, one damaged gun additional.
93. Fort Hsitaiyangkou: Four 12-pounder naval, blinded; four 10.5 cm. siege guns.
94. Emplacements for four siege guns, no armament.
95. Two 12-pounder naval.
96. Four 47-mm. naval.
97. Two 12-pounder naval, casemated.
98. Two 47-mm. blinded.
99. Two 12-pounder naval, open emplacements.
100. Three 12-pounder naval, open emplacements, horizontal 1 to 2 inch shields.
101. Four 37-mm.
102. Five 15-cm. pedestal mounts, coast defense.
103. Four 23-cm. howitzers, F. P., carriages.
104. Four 9-inch Krupp (model 1870) rifles.
105. Eight 23-cm. howitzers, F. P., carriages.
106. Four 28-cm. howitzers (one piece with cracked trunnion band).
107. Five 15-cm. pedestal mounts, No. 1 gun missing, No. 4 gun burst.
108. Three 15-cm. short rifles, garrison C. P. mounts.
109. Three naval 12-pounders.

NOTE.—The armament listed is that actually accounted for at time of inspection during January and February, 1905. Very little of the mobile armament is included, all of it, or nearly all, having been at once collected and parked or put in buildings by the Japanese.

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